AIR QUALITY PERMIT

Issued to:	Stillwater Mining Company Columbus Metallurgical Complex HC 54, Box 365 Nye, MT 59061	Permit: #2635-10 Application Complete: 04/16/03 Preliminary Determination Issued: 05/12/03 Department Decision Issued: 06/05/03 Permit Final: 06/21/03 AFS #095-0002

An air quality permit, with conditions, is hereby granted to the Stillwater Mining Company – Columbus Metallurgical Complex (Stillwater) pursuant to Sections 75-2-204 and 211 of the Montana Code Annotated (MCA), as amended, and the Administrative Rules of Montana (ARM) 17.8.701, *et seq.*, as amended, for the following:

SECTION I: Permitted Facilities

A. Plant Description

Stillwater operates a platinum group precious metals smelter and refinery in Columbus, Montana. The legal description of the site is Section 27, Township 2 South, Range 20 East, Stillwater County, Montana. A complete list of permitted equipment is contained in Section I.A of the permit analysis.

B. Current Permit Action

On April 16, 2003, the Montana Department of Environmental Quality (Department) received a complete permit application from Stillwater for proposed changes to the facility. Specifically, the current permit action provides for the following changes to the existing permitted facility:

- An increase in the previously proposed and permitted (Permit #2635-09) operational limits on the production of gypsum and slag and the use of crushed rock to line the slag-pit under the provisions of ARM 17.8.745(1);
- A review and new determination of previous Best Available Control Technology (BACT) determinations requiring fabric filter baghouse control for various bins and silos contained in the smelter building (Permit #2635-06);
- A permit clarification of required control technology for the concentrate dryer operations at the facility;
- The addition of 2 natural gas-fired dryers to the Laboratory Sample Prep Area under the provisions of ARM 17.8.744(1)(c);
- The replacement of the existing and permitted revert cone crusher with a like-kind revert cone crusher under the provisions of ARM 17.8.745(1); and
- The incorporation of permit language to potentially allow for future off-permit "like-kind" replacement of various equipment to the permitted facility in accordance with ARM 17.8.745(1).

A complete emission inventory, including all proposed changes under the current permit action is contained in Section III of the permit analysis to this permit. Further, the required BACT analysis for the various bins and silos contained within the smelter building is contained in Section V of the permit analysis to this permit.

In addition, Stillwater provided the Department with comments on the preliminary determination (PD). Based on the comments received, the Department made various

changes to the PD issued on May 12, 2003. A more detailed discussion of the changes is contained in Section I.C of the permit analysis to this permit.

SECTION II: Limitations and Conditions

A. Emission Limitations

1. Particulate emissions from each smelting circuit (Smelter #1 and Smelter #2) shall be limited to 0.011 grains per dry standard cubic foot (gr/dscf). This emission limitation applies at each main stack (ARM 17.8.749 and ARM 17.8.1204).

2. Process fugitive emissions are subject to an opacity limitation of 10% (40 CFR Part 60, Subpart LL and ARM 17.8.340).

3. Sulfur dioxide emissions from Smelter #1 shall be limited to (ARM 17.8.749):

   a. 86 pounds per hour calculated on a 1-hour averaging basis

   b. 24 pounds per hour calculated on a rolling 24-hour average basis

   c. 22 tons per year calculated on a rolling 12-month average

4. Sulfur dioxide emissions from Smelter #2 shall be limited to (ARM 17.8.749):

   a. 235 pounds per hour calculated on a 1-hour averaging basis

   b. 50 pounds per hour calculated on a rolling 24-hour average basis

   c. 74 tons per year calculated on a rolling 12-month average

5. A continuous emissions monitoring system (CEMS) to monitor stack volumetric flow rate and record sulfur dioxide emissions discharged to the atmosphere shall be installed and operated on both Smelter #1 and Smelter #2 to demonstrate compliance with Sections II.A.3 and II.A.4 of this permit. If the concentrate dryer is the only source of emissions venting through Smelter #1, the CEMS on Smelter #1 need not be operational (ARM 17.8.749).

   The monitoring systems shall be certified according to the performance specification procedures of 40 CFR Part 60, Appendix B, Performance Specifications 2 and 6. The continuous emission monitoring system must meet the quality assurance requirements contained in 40 CFR Part 60, Appendix F, with the exception that a Relative Accuracy Test Audit (RATA) be performed at least every 2 years, rather than every year, and that either a Cylinder Gas Audit (CGA) or Relative Accuracy Audit (RAA) be performed in each of the other quarters in the 2-year period (ARM 17.8.749 and 40 CFR Part 60).

6. Stillwater shall not cause or authorize emissions to be discharged into the outdoor atmosphere from any source installed after November 23, 1968, that exhibit an opacity of 20% or greater averaged over 6 consecutive minutes (ARM 17.8.304).

7. For Smelter #2, the hydrated lime silo shall be controlled by a baghouse. Particulate emissions from the baghouse shall be limited to 0.02 gr/dscf (ARM 17.8.752).

8. Particulate emissions from the concentrate dryer shall be controlled by a baghouse. The concentrate dryer exhaust air stream shall be routed to the concentrate dryer baghouse and then vented to the main stack for Smelter #1. Particulate matter emissions from the baghouse shall be limited to 0.011 gr/dscf. This emission limit shall be applied at the main stack for smelter #1 (ARM 17.8.749).

9. Particulate emissions from the nickel sulfate crystal dryer at the Base Metals Refinery shall be controlled by a baghouse. Particulate matter emissions shall be limited to 0.022 gr/dscf (ARM 17.8.749).

10. Stillwater shall apply water and/or chemical stabilization to the general work area, haul roads, and access roads, as necessary, to control fugitive emissions (ARM 17.8.749).

11. Particulate emissions from the 200-ton dried concentrates silo shall be controlled by a baghouse. Particulate matter emissions from the baghouse shall be limited to 0.05 grams per dry standard cubic meter (g/dscm) (0.022 gr/dscf) (40 CFR Part 60, Subpart LL, and ARM 17.8.340).

12. Stack emissions from any affected facility, not discharged from a wet scrubber, are subject to an opacity limitation of 7% (40 CFR Part 60, Subpart LL, and ARM 17.8.340).

13. Stillwater shall limit PM_{10} emissions from the facility to a level that does not exceed 100 tons during any rolling 12-month time period. Any calculations used to establish PM_{10} emissions shall be approved by the Department and shall incorporate the emission limits contained in Section II.A.1 (as demonstrated through source testing on an every-2-year basis) (ARM 17.8.749).

B. Operational Limitations

1. Maximum combined concentrate and/or platinum group metal (PGM) catalyst throughput at smelting circuit #1 and smelting circuit #2 shall be limited to 48,550 tons during any rolling 12-month time period (ARM 17.8.749).

2. Emissions from the following sources shall be routed to the #1 Smelter main stack and through all Smelter #1 associated emission control equipment (baghouse and scrubber). Particulate matter emissions from these sources are subject to the emission limit for Smelter #1. This emission limit shall be applied at the main stack for Smelter #1 (ARM 17.8.749):

   a. Revert Crusher
   b. Furnace Number 1
   c. Top Blown Rotary Converter (TBRC) 1-1
   d. TBRC 1-2
   e. #1 Dried Concentrates Bin
   f. #1 TBRC Slag/Catalyst Reverts/Iron Residue Bin
   g. #1 Batch Bin

3. Emissions from the following sources shall be routed to the #2 Smelter main stack and through all Smelter #2 associated emission control equipment (baghouse and scrubber). Particulate matter emissions from these sources are subject to the emission limit for Smelter #2. This emission limit shall be applied at the main stack for Smelter #2 (ARM 17.8.749):

   a. Furnace Number 2
   b. TBRC 2-1
   c. TBRC 2-2
   d. TBRC 2-3
   e. EF Matte/TBRC Slag Dryer
   f. TBRC Matte Dryer

4. Stillwater shall comply with all applicable standards and limitations, and the reporting, recordkeeping, monitoring, and notification requirements of 40 CFR 60, Subpart LL, Standards of Performance for Metallic Mineral Processing Plants (40 CFR Part 60, Subpart LL).

5. Gypsum production shall be limited to 25,000 tons during any rolling 12-month time period (ARM 17.8.749).

6. Smelter slag production shall be limited to 60,000 tons during any rolling 12-month time period (ARM 17.8.749).

7. The amount of waste ore, used for lining the slag pit, delivered to and handled at the facility shall be limited to 40,000 tons during any rolling 12-month time period (ARM 17.8.749).

C. Testing Requirements

1. Stillwater shall conduct particulate and opacity performance source tests on the main stacks for smelting circuit #1 and smelting circuit #2 to demonstrate compliance with the applicable emission limit(s) in Section II.A.1. The test shall be performed within 60 days after achieving the maximum production rate, but not later than 180 days after issuance of Permit #2635-09. Additional compliance source testing shall be conducted on the smelting circuit #1 and smelting circuit #2 stacks every 2 years or according to another testing/monitoring schedule as may be approved by the Department (ARM 17.8.340 and ARM 17.8.749).

2. Stillwater shall conduct an initial SO_2 performance source test on the second smelting circuit's main stack to demonstrate compliance with the emission limit in Section II.A.4. After the initial source test, the stack shall be tested on an every-5-year basis or according to another testing/monitoring schedule as may be approved by the Department (ARM 17.8.749 and ARM 17.8.105).

3. Stillwater shall conduct an initial particulate performance source test on the process baghouse for the nickel sulfate crystal dryer, at the Base Metals Refinery, to demonstrate compliance with the emission limit in Section II.A.9. The test shall be performed within 60 days after achieving the maximum production rate, but not later than 180 days after initial start up of the new nickel sulfate crystal dryer. Testing shall continue on an every-5-year basis after the initial source test or according to another testing/monitoring schedule as may be approved by the Department (ARM 17.8.749).

4. Stillwater shall conduct an initial particulate performance source test on the baghouse controlling emissions from the 200-ton dried concentrates silo to demonstrate compliance with the emission limit in Section II.A.11. The test shall be performed within 60 days after achieving the maximum production rate, but not later than 180 days after initial start up of the dried concentrates silo (ARM 17.8.340 and 40 CFR 60, Subpart LL).

5. Stillwater shall conduct an initial particulate performance source test on the baghouse controlling emissions from the hydrated lime silo (Smelter #2) to demonstrate compliance with the emission limit in Section II.A.7. The test shall be performed within 60 days after achieving the maximum production rate, but not later than 180 days after initial start up of the hydrated lime silo (ARM 17.8.340 and 40 CFR 60, Subpart LL).

6. All compliance source tests shall be conducted in accordance with the Montana Source Test Protocol and Procedures Manual (ARM 17.8.106).

7. The Department may require further testing (ARM 17.8.105).

D. Monitoring and Reporting Requirements

1. Stillwater shall submit a quality assurance plan for smelting circuit #2 detailing all facets of the program, including recordkeeping and reporting. The plan must be approved and implemented by the actual date of smelting circuit #2's start up. The Department may not require Stillwater to submit a quality assurance plan for smelting circuit #2 if the CEMS and control equipment are similar to smelter #1. Any such arrangement shall be specified in writing (ARM 173.8.749).

2. Stillwater shall supply the Department with annual production information for all emission points, as required by the Department in the annual emission inventory request. The request will include, but is not limited to, all sources of emissions identified in the permit analysis. Information shall be in the units required by the Department. This information may be used for calculating operating fees, based on actual emissions from the facility, and/or to verify compliance with permit limitations (ARM 17.8.505).

3. Stillwater shall notify the Department of any construction or improvement project conducted pursuant to ARM 17.8.745(1) that would include a change in control equipment, stack height, stack diameter, stack flow, stack gas temperature, source location, or fuel specifications, or would result in an increase in source capacity above its permitted operation or the addition of a new emissions unit.

   The notice must be submitted to the Department, in writing, 10 days prior to start up or use of the proposed de minimis change, or as soon as reasonably practicable in the event of an unanticipated circumstance causing the de minimis change, and must include the information requested in ARM 17.8.745(1)(d) (ARM 17.8.745).

4. Stillwater shall document, by month, the amount of concentrate and/or PGM catalyst throughput at smelting circuit #1 and at smelting circuit #2. By the 25th day of each month, Stillwater shall total the amount of concentrate and/or PGM catalyst handled in smelting circuit #1 and at smelting circuit #2 during the previous 12 months to verify compliance with the limitations in Sections II.B.1.

A written report of the compliance verification shall be submitted annually to the Department no later than March 1 and may be submitted along with the annual emission inventory (ARM 17.8.749).

5. Stillwater shall document, by month, the amount of gypsum produced. By the 25th day of each month, Stillwater shall total the amount of gypsum produced during the previous 12 months to verify compliance with the limitations in Sections II.B.5. A written report of the compliance verification shall be submitted annually to the Department no later than March 1 and may be submitted along with the annual emission inventory (ARM 17.8.749).

6. Stillwater shall document, by month, the amount of smelter slag produced. By the 25th day of each month, Stillwater shall total the amount of smelter slag produced during the previous 12 months to verify compliance with the limitations in Sections II.B.6. A written report of the compliance verification shall be submitted annually to the Department no later than March 1 and may be submitted along with the annual emission inventory (ARM 17.8.749).

7. Stillwater shall document, by month, the amount of waste ore, used to line the slag pit, delivered to the facility. By the 25th day of each month, Stillwater shall total the amount of waste ore delivered to the facility during the previous 12 months to verify compliance with the limitations in Sections II.B.7. A written report of the compliance verification shall be submitted annually to the Department no later than March 1 and may be submitted along with the annual emission inventory (ARM 17.8.749).

8. Stillwater shall annually certify, as required by ARM 17.8.1204(3)(b), that its actual emissions are less than those that would require the source to obtain an air quality Title V operating permit. The annual certification shall comply with the certification requirements of ARM 17.8.1207. The annual certification shall be submitted no later than March 1 and may be submitted with the annual emission inventory information.

9. Stillwater shall document, by month, the PM_{10} emissions from the facility. By the 25th day of each month, Stillwater shall total the PM_{10} emissions from the facility during the previous 12 months to verify compliance with the limitation in Section II.A.13. A written report of the compliance verification shall be submitted annually to the Department no later than March 1 and may be submitted along with the annual emission inventory. Any calculations made to determine PM_{10} emissions shall be approved by the Department and, where applicable, shall be based on unit capacities and emission limits contained in Section II.A. of this permit (ARM 17.8.749).

E. Notification

Stillwater shall provide the Department with written notification of the following dates within the specified time periods:

1. Stillwater shall notify the Department, in writing, within 30 days of the date construction is commenced on any affected facility defined under 40 CFR 60, Subpart LL (ARM 17.8.340 and 40 CFR 60, Subpart LL).

2. Stillwater shall notify the Department within 15 days after the actual date of initial start up of an affected facility defined in 40 CFR 60, Subpart LL (ARM 17.8.340 and 40 CFR 60, Subpart LL).

SECTION III: General Conditions

A. Inspection – Stillwater shall allow the Department's representatives access to the source at all reasonable times for the purpose of making inspections or surveys, collecting samples, obtaining data, auditing any monitoring equipment (CEMS, CERMS) or observing any monitoring or testing, and otherwise conducting all necessary functions related to this permit.

B. Waiver – The permit and the terms, conditions, and matters stated herein shall be deemed accepted if Stillwater fails to appeal as indicated below.

C. Compliance with Statutes and Regulations – Nothing in this permit shall be construed as relieving Stillwater of the responsibility for complying with any applicable federal or Montana statute, rule, or standard, except as specifically provided in ARM 17.8.740, *et seq*. (ARM 17.8.756).

D. Enforcement – Violations of limitations, conditions and requirements contained herein may constitute grounds for permit revocation, penalties or other enforcement action as specified in Section 75-2-401, *et seq*., MCA.

E. Appeals – Any person or persons jointly or severally adversely affected by the Department's decision may request, within 15 days after the Department renders its decision, upon affidavit setting forth the grounds therefore, a hearing before the Board of Environmental Review (Board). A hearing shall be held under the provisions of the Montana Administrative Procedures Act. The Department's decision on the application is not final unless 15 days have elapsed and there is no request for a hearing under this section. The filing of a request for a hearing postpones the effective date of the Department's decision until conclusion of the hearing and issuance of a final decision by the Board.

F. Permit Inspection – As required by ARM 17.8.755, Inspection of Permit, a copy the air quality permit shall be made available for inspection by the Department at the location of the source.

G. Permit Fee – Pursuant to Section 75-2-220, MCA, as amended by the 1991 Legislature, failure to pay the annual operation fee by Stillwater may be grounds for revocation of this permit, as required by that section and rules adopted thereunder by the Board.

H. Construction Commencement – Construction must begin within 3 years of permit issuance and proceed with due diligence until the project is complete or the permit shall be revoked (ARM 17.8.762).

Permit Analysis
Stillwater Mining Company – Columbus Metallurgical Complex
Permit #2635-10

I. Introduction

A. Permitted Equipment/Emitting Units

Emitting Unit	**Stack**
Smelting Circuit #1	Vents to Stack
Soda Ash Silo (Smelter #1)	Vents to Stack
Limestone Flux Feed System (Smelter #1)	Vents Inside Building
Pebble Lime Feed System (Smelter #1)	Vents Inside Building
Hydrated Lime Silo (Smelter #1)	Vents to Stack
Smelting Circuit #2	Vents to Stack
Limestone Flux Bin (Smelter #2)	Vents Inside Building
Pebble Lime Feed System (Smelter #2)	Vents Inside Building
Hydrated Lime Silo (Smelter #2)	Vents to Stack
Gypsum Dumping and Loading	Fugitive Emissions
Ore Dumping and Handling (Slag Pit Liner)	Fugitive Emissions
Haul Roads	Fugitive Emissions
Concentrate Dryer (30-Ton)	Vents to Stack
NSC Dryer	Vents to Stack
Dried Concentrates Silo	Vents to Stack
Smelter Emergency Generator #1 (600 kw)	Vents to Stack
Smelter Emergency Generator #2 (600 kw)	Vents to Stack
Refinery Emergency Generator	Vents to Stack
Steam Generator (15 MMBtu/hr)	Vents to Stack
Fire Assay Area Baghouse	Vents to Stack
Fire Assay Area Fume Hoods (6)	Vents to Stack
Security Area Baghouse	Vents Inside Building
Sample Preparation Area Baghouse	Vents Inside Building
Sample Preparation Dryer #1	Vents Inside Building
Sample Preparation Dryer #2	Vents Inside Building
Sample Preparation Area Fume Hoods (4)	Vents Inside Building
Nickel Sulfate Bagging Unit Baghouse	Vents to Stack
Smelter Slag Material Transfer	Fugitive Emissions
EF Matte/TBRC Slag Dryer	Vents to Stack
TBRC Matte Dryer	Vents to Stack
Refinery Main Scrubber	Vents to Stack
Refinery Electrowin Scrubber	Vents to Stack
Refinery Electrowin Area	Vents Inside Building
SO_2 Hygiene Fan	NA
Granulator	NA
Revert Crushing Area	Vents to Stack
30-ton Wet Concentrate Dryer Feed Hopper	Vents Inside Building
40-ton #2 Dried Concentrates Bin	Vents to Indoor Stack
Dust Bin	Vents to Stack
Secondaries/Iron Residue Bin	Vents Inside Building
TBRC Slag Bin	Vents Inside Building
EF Matte Bin	Vents Inside Building
Security Area Electric Dryers	Vents to Stack
Moffit Smelter Building Heaters (2)	Vents to Stack
Circular Refinery Building Heater	Vents to Stack
Secondary Preparation Building	Vents Inside Building
Refinery Laboratory Scrubbers (2)	Vents to Stack

B. Permit History

The original air quality **Permit (#2635)** for this facility was issued May 9, 1990. The initial process rate was planned at 15 tons per day of concentrate, which corresponded to an ore production rate of 1000 tons per day from the Stillwater Mine. The permit analysis was based on a process rate of 30 tons per day of concentrate in anticipation of increased production.

The Department of Environmental Quality (Department) determined that the most significant air quality concern with the project is sulfur dioxide (SO_2) emissions. All process gases from the electric furnace, top blown rotary converters (TBRC), and granulation drier, as well as gases from all the tap hoods, are ducted to the scrubbing system. The rated capacity of the scrubber is 15,000 standard cubic feet per minute (SCFM), containing 370-lb particulate/hr and 2242-lb SO_2/hr. The spent scrubbing solution is "regenerated" by adding hydrated lime, which precipitates the sulfur solids and is then pumped to a filter for final removal of gypsum solid from the circuit. The thickener overflow is softened by bubbling carbon dioxide (CO_2) gas through the solution that precipitates calcium carbonate. Soda ash, which is added to make up sodium in the scrubbing solution, also has a softening effect. The solids from the slurry are removed by cycloning and then are filtered along with the gypsum. The now regenerated and softened solution is sent to the scrubber make-up tank and is ready for re-use.

Concentrate storage bins, bucket elevators, and screw feeders are ducted through a baghouse for particulate removal. The cleaned air then joins the scrubber exhaust and is ducted to the stack. Process exhaust air from the furnace, TBRC, and granulation circuit is routed through a process baghouse for removal of particulate. The exhaust from the process baghouse is then routed to the scrubbing circuit for SO_2 removal.

The performance of the gas cleaning system is monitored with inlet and outlet SO_2 continuous emission monitors (CEMS) and gas flow, pressure, and temperature sensors. Operator alarms to adjust the system are activated if limits are approached. If the adjustments are ineffective in reducing the SO_2 level, oxygen to the TBRC is automatically shut down, suspending the primary SO_2 source.

The project includes two 50-kW portable diesel generators to provide temporary or emergency electricity.

The first permit alteration was given **Permit #2635-01** and was issued February 10, 1993. The permit alteration included an increase in concentrate input from 30 tons per day to 40 tons per day. Sulfur dioxide emission limitation increases were also approved.

Permit #2635-02 was issued December 21, 1993, as a modification that incorporated the construction and operation of a small base metal refinery. The process involves the acid leaching of copper, nickel, and iron from the matte produced in the smelting process. The product would be sold to off-site refiners and the purified matte containing the platinum group metals would be sent for additional hydrometallurgical refining. There would be no measurable increase in air pollutant emissions from the operation; therefore, a permit alteration was not required.

Permit #2635-03 was a modification issued April 15, 1994, which incorporated language to clarify the quality assurance requirements relative to the outlet SO_2 CEMS. This language was placed in Section II.D of the permit.

Permit #2635-04 was a modification issued on August 1, 1994, to clarify language in a previous permit analysis. Specifically, in the discussion on Permit #2635-02, language was deleted, which indicated that process gas streams would not be vented to the atmosphere. Originally, it was planned to vent internally the off-gas from the acid de-mister associated with the base metal refinery. However, due to its high moisture content, it was later determined these off-gases should be vented to the atmosphere. This does not change the original determination that there would be no measurable increase in air pollutant emissions associated with the base metal refinery.

Permit #2635-05 was issued on March 24, 1995. The permit was a modification to allow the processing of spent platinum and palladium catalyst (platinum group metals in a ceramic matrix). This material is being considered within the concentrate throughput limitation so there would be no increase in allowable emissions.

Stillwater submitted a permit application on May 1, 1998, which was given **Permit #2635-06**. A complete permit application was submitted on June 17, 1998. The application proposed a second smelting circuit essentially the same as the existing smelter, but with an increased capacity of 100 tons per day of concentrate and/or platinum group metal (PGM) catalyst. The proposed second smelting circuit included new silos, bins, an electric furnace, TBRCs, granulators, and a dryer.

Stillwater proposed to install similar particulate and sulfur dioxide control measures as already demonstrated at the existing smelter. The process gases for the electric furnace, the TBRCs, and the granulation dryer are ducted to a baghouse for particulate control. The gases exiting from the baghouse proceed to a scrubber for removal of sulfur dioxide gases. The existing scrubber demonstrated a control efficiency over 99.5% for sulfur dioxide. Particulate emissions from the silos and bins are controlled by baghouses.

In addition to the changes discussed above, several other modifications to the facility were also proposed. Additional refinement steps for copper and nickel were proposed at the base metals refinery circuit. An analytical laboratory was also proposed. The laboratory is primarily involved with the assaying of samples for platinum group metals. Dust generated at the laboratory is controlled by a baghouse. In a letter dated May 15, 1998, the Department determined these changes did not require a permit pursuant to ARM 17.8.705. However, the refinery and analytical laboratory are subject to generally applicable requirements, which are listed in this permit.

The second smelting circuit resulted in an increase in emissions in tons per year of 73.4, 62.7, 62.6, 6.3, and 1.6 of SO_2, particulate matter (PM), particulate matter less than 10 microns (µm) aerodynamic diameter (PM_{10}), oxides of nitrogen (NO_x), and carbon monoxide (CO), respectively. Total allowable emissions from the facility, including both smelting circuit #1 and #2, in tons per year, are approximately 96.2, 86.9, 85.9, 8.14, 1.94 of SO_2, particulate matter, PM_{10}, NO_x, and CO, respectively.

The facility is not subject to Prevention of Significant Deterioration (PSD) because this facility is not a listed source, nor is the site's potential to emit above 250 tons per year of any pollutant (excluding fugitive emissions), once federally enforceable limits are applied.

The facility was subject to Title V of the Federal Clean Air Act (FCAA) because the facility's potential to emit of SO_2 was greater than 100 tons/year. The facility requested annual emission limitations and a production limit to allow the facility to stay below the emission's threshold that would require a Title V operating permit. Therefore, Permit #2635-06 included annual emission limits, an operational limit, and reporting

requirements to verify annually that the facility's emissions are less than 100 tons per year of SO_2.
In Stillwater's June 17, 1998, submittal, the facility proposed a 1-hour emission limit of 100 pounds for smelter #1 and a 1-hour emission limit of 250 pounds for smelter #2. The Department determined these emission limits did not demonstrate compliance with the National Ambient Air Quality Standards (NAAQS) 3-hour SO_2 limit, nor the Montana Ambient Air Quality Standards (MAAQS) 1-hour SO_2 limit. Emission limits of 86 pounds per hour on smelter #1 and 235 pound per hour on smelter #2 were imposed in this permit to demonstrate compliance with the NAAQS and MAAQS. The 24-hour rolling average hourly emission rate of 24 pounds per hour of SO_2 for smelter #1 and 50 pounds per hour of SO_2 for smelter #2, proposed by the applicant, demonstrated compliance with NAAQS and MAAQS. Therefore, these emission limits were incorporated into the permit.

The facility also proposed annual emission limits for each smelter. The Department did not use the proposed emission limits. Annual SO_2 emission limits were derived from the annual concentrate throughput limits for each smelter. Stillwater proposed a daily and annual concentrate throughput limit for the combined smelters. The Department determined an annual throughput limit for each smelter was sufficient to demonstrate that the facility's emissions were less than 100 tons per year of SO_2.

Permit #2635-05 required CEMS on the main stack to demonstrate compliance with SO_2 emission limits. Stillwater proposed CEMS on the main stack of the second smelting circuit. The Department determined, at the time, CEMS were appropriate to demonstrate compliance with SO_2 emission limits on the main stacks for both smelting circuits. However, this does not prevent Stillwater from requesting a different method to demonstrate compliance with the emission limits in Section II.A.3 and 4 in the future. In addition, Stillwater may permanently shut down smelting circuit #1 once smelting circuit #2 is functioning. At such time, the facility may apply for a permit change to allow for increased emission limits and throughput limits.

The Department received written comments from Stillwater dated July 15, 1998, on the preliminary determination. Stillwater commented that the term *concentrate* should be amended to read *concentrate and/or PGM catalyst*. The Department recognizes that Stillwater is capable of using both concentrate and PGM catalyst in the smelting circuit. A previous permit modification, #2635-05, allowed the facility to use spent platinum and palladium catalyst. Therefore, the Department replaced the word *concentrate,* in Permit #2635-06, with *concentrate and/or PGM catalyst*.

Stillwater commented that the rolling average for concentrate and or PGM catalyst throughput could restrict Stillwater's ability to make-up production due to equipment failures or furnace and TBRC re-bricking. Stillwater is a synthetic minor source because emission limits and production limits were established to keep annual SO_2 emissions below 100 tons per year. EPA requires permit limits to be enforceable, as a practical matter, and has advised the Department to incorporate averaging times that allow at least monthly checks on compliance. The throughput limitation in the permit was the equipment's maximum capacity. Therefore, the Department does not anticipate that the facility's production should be limited by the averaging time of the annual emission limit. The Department did not change the language in conditions II.B.1 and II.B.2.

The facility commented that the requirement to install, calibrate, maintain, and monitor a gas pressure device and a liquid flow rate device on the scrubbing circuit is redundant and should be dropped from the permit. The Department determined that 40 CFR 60,

Subpart LL - Standards of Performance for Metallic Mineral Processing Plants is applicable to the smelting circuits. 40 CFR 60.384 contains monitoring requirements for scrubbers for any affected facility. Sections II.D.1 and 2 of the permit incorporated these New Source Performance Standards (NSPS) requirements into Permit #2635-06. In order for Stillwater to not be required to comply with these conditions, an official waiver from the NSPS monitoring requirements is necessary. The Department agreed to remove conditions II.D.1 and 2 from Permit #2635-06. The Department removed these conditions so that, in the future, if a waiver from the NSPS monitoring requirements was granted, a permit modification may not be required. However, until a waiver is granted, 40 CFR 60, Subpart LL, is still applicable, including the scrubber's monitoring requirements. Stillwater may submit a letter requesting that both smelting circuits be waived from complying with 40 CFR 60.384.

On July 14, 1998, the Department received a request from Stillwater to increase the throughput limitation on smelting circuit #1 from 10,950 to 11,500 tons per year. The Department agreed to increasing smelting circuit #1's limitation because SO_2 emissions at the facility remain less than 100 tons per year. The 11,500-ton-per-year concentrate limit results in an annual SO_2 emission from smelting circuit #1 of 22.77 tons per year. The SO_2 emission rate from the facility is 96.16 tons per year. Permit #2635-06 replaced Permit #2635-05.

On July 10, 2000, Stillwater submitted a complete permit application for the installation and operation of a natural gas-fired concentrate dryer in the Smelter and a natural gas-fired nickel-sulfate crystal dryer in the Base Metals Refinery. The concentrate dryer vents through the existing smelter circuit #1 baghouse and increases potential flow through the stack by 6000 acfm. Further, the nickel-sulfate crystal dryer in the Base Metals Refinery is utilized as a process application for the capture of product and required installation of a new 2000-acfm baghouse. Calculations indicating potential emissions from the proposed project are contained in the emission inventory in Section III of the permit analysis for Permit #2635-07.

In addition, Stillwater requested that the production limit of 11,500-ton/year throughput for smelter circuit #1 and the 37,050-ton/year throughput limit for smelter #2, as stated in Permit #2635-06, be re-stated as a combined throughput production limit of 48,550 ton/year through smelting circuit #1 and smelting circuit #2. The new combined throughput limit is found in Section III.B.1. Permit **#2635-07** replaced Permit #2635-06.

On January 22, 2001, the Department received a letter from Stillwater requesting a Department determination on three separate issues regarding operations at the Columbus Smelter facility. These issues included the following:

- A request for removal of the SO_2 CEM requirement for Smelter Circuit #1 when only the concentrate dryer is venting through the circuit;
- A request for a de minimis determination for the construction and operation of a new 200-ton capacity dried concentrates silo; and
- A request for a need for permit determination to increase the capacity of the current bin baghouse located within the smelter building.

Under Permit #2635-06, Stillwater permitted, constructed, and is currently processing all concentrates in Smelting Circuit #2. Smelting Circuit #1 remains intact, but is operated only in the event of excess ore availability or if Smelting Circuit #2 goes down for an extended period of time. Further, under Permit #2635-07, Stillwater permitted the construction and operation of a concentrate dryer at the smelter facility. Concentrate dryer emissions vent through a baghouse and exit the Smelting Circuit #1 stack.

Stillwater anticipates that in most instances the concentrate dryer will be the only source discharging through the Smelting Circuit #1 stack.
The permitted SO_2 CEM requirement for Smelting Circuit #1 was in place for documenting SO_2 emissions during smelting operations that have significant potential process SO_2 emissions. Stillwater demonstrated, to the Department's satisfaction, that concentrate drying activities will not result in significant, if any, SO_2 emissions. Therefore, the Department removed the CEM requirement from Smelting Circuit #1 during times when the concentrate dryer is the only source venting through the circuit.

Further, as previously cited, Stillwater submitted a de minimis determination involving the construction and operation of a 200-ton capacity dried concentrates silo. The silo utilizes baghouse control. However, because potential uncontrolled emissions from the silo were less than 15 tons per year, the Department determined that construction and operation of the silo can be accomplished under the provisions of the Administrative Rules of Montana (ARM) 17.8.705 (1)(r). The Department added the dried concentrates silo as part of the permit action.

Finally, the bin baghouse vents directly into the smelter building and is utilized as a process/ hygiene control device rather than an emission control device. Because the baghouse vents exclusively to the indoor atmosphere, the Department did not quantify emissions or incorporate these emissions into the air quality permit. Permit **#2635-08** replaced Permit #2635-07.

Based on compliance inspection findings in August of 2001, the Department sent Stillwater letters requesting information regarding several emitting units, currently operating at the facility, which are not included in the air quality permit. The Department's letters also indicated that Stillwater was permitted as a synthetic minor source of emissions as defined under the Title V operating permit program. Through various correspondence, and a subsequent site visit/inspection in August of 2002, the Department determined that, as permitted under Permit #2635-08, the total facility potential to emit (PTE) for PM_{10} exceeded the Title V operating permit PTE threshold of 100 tons per year for PM_{10}.

Further, based on the Department's findings, Stillwater sent the Department a request for a permit modification to incorporate federally enforceable permit limits to bring the facility PM_{10} PTE to a level below the Title V operating permit threshold for the purpose of maintaining Title V synthetic minor status. Specifically, the modification request proposed new emission limits for both the #1 and #2 smelting circuits and identified several emitting units that vent inside the building and are not counted toward the facility's PTE. Further, the request indicated that the flow rate for the smelting circuit #2 had increased from 75,000 actual cubic feet per minute (acfm) to 100,000 acfm. Also, the modification request included a demonstration that all of the un-permitted emitting units had been added to the facility in accordance with ARM 17.8.705(1)(r). Finally, Stillwater requested that Gypsum production/material handling and Smelter Slag production/material handling be added to the permit under ARM 17.8.705(1)(r).

The proposed limits brought the total facility PTE to a level below the Title V operating permit threshold for PM_{10} allowing Stillwater to remain a Title V synthetic minor source. A total facility emission inventory demonstrating that emissions are less than the Title V operating permit threshold for all regulated pollutants was included in Section III of the permit analysis for Permit #2635-09. Further, the permit action incorporated all existing equipment into the permitted list of equipment at the facility. Permit **#2635-09** replaced Permit #2635-08.

C. Current Permit Action

On April 16, 2003, the Montana Department received a complete permit application from Stillwater for proposed changes to the permitted facility. Specifically, the current permit action provides for the following changes to the existing permitted facility:

- An increase in the previously proposed and permitted (Permit #2635-09) operational limits on the production of gypsum and slag and the use of crushed rock to line the slag-pit under the provisions of ARM 17.8.745(1);
- A review and new determination of previous Best Available Control Technology (BACT) determinations requiring fabric filter baghouse control for various bins and silos contained in the smelter building (Permit #2635-06);
- A permit clarification of required control technology for the concentrate dryer operations at the facility;
- The addition of 2 natural gas-fired dryers to the Laboratory Sample Prep Area under the provisions of ARM 17.8.744(1)(c);
- The replacement of the existing and permitted revert cone crusher with a like-kind revert cone crusher under the provisions of ARM 17.8.745(1); and
- The incorporation of permit language to potentially allow for future off-permit "like-kind" replacement of various equipment to the permitted facility in accordance with ARM 17.8.745(1).

A complete emission inventory, including all proposed changes under the current permit action is contained in Section III of this permit analysis. Further, the required BACT analysis for the various bins and silos contained within the smelter building is contained in Section V of this permit analysis.

In addition, Stillwater provided the Department with comments on the preliminary determination. Based on the comments received, the Department made the following changes to the preliminary determination (PD) issued on May 12, 2003:

- The Smelter #2 Soda Ash Silo has been removed from all aspects of the permit.
- The Limestone Flux Silo #1 (Limestone Flux Feed System #1) has been properly identified as an indoor venting source.
- The following 4 emitting units have been correctly identified as venting to the Smelter #1 emission control equipment: TBRC1-2; #1 Dried Concentrates Bin; #1 TBRC Slag/Catalyst Reverts/Iron Residues Bin; and the #1 Batch Bin.
- The 40-ton #2 Dried Concentrates Bin, Dust Bin, and the Limestone Flux Bin #2 have been properly identified as indoor venting sources controlled by baghouses.
- The Security Area Electric Dryers have been correctly referenced as venting to a distinct process baghouse, not to the Smelter #2 emission control equipment.
- The particulate performance source testing schedule for the Nickel Sulfate Crystal Dryer, has been modified (relaxed) according to Department source testing guidance. Testing will be required on an every-5-year basis.
- For clarification, the Limestone Flux Silo (Smelter #1) reference in the permit analysis emission inventory (EI) has been changed to reflect the correct Limestone Flux Bin (Smelter #1) nomenclature.
- For clarification, the Lime Flux Silo terminology for the respective units on Smelter #1 and Smelter #2 has been changed to indicate the correct Pebble Lime Feed System nomenclature.

- For clarification, the Limestone Flux Silo (Smelter #2) reference in the permit analysis EI has been changed to reflect the correct Limestone Flux Bin (Smelter #2) nomenclature.
- For clarification, the 30-ton Wet Concentrates Silo reference in the permit analysis EI has been changed to reflect the correct 30-ton Wet Concentrate Dryer Feed Hopper nomenclature.
- For clarification, the 40-ton Dried Concentrates Silo reference in the permit analysis EI has been changed to reflect the correct 40-ton #2 Dried Concentrates bin nomenclature.
- For clarification, the permit analysis EI has been updated to reflect the existence of 4 EF Matte Bins on the Smelter #1 and #2 circuits. The PTE is not affected by this fact because the maximum throughput and emission factors remain the same.
- For clarification, the Refinery Lab Fume Hoods (7) reference in the permit analysis EI has been changed to indicate that the actual emitting units are the 2 lab scrubbers, which the fume hoods vent through.

Permit **#2635-10** replaces Permit #2635-09.

D. Additional Information

Additional information, such as applicable rules and regulations, BACT determinations, air quality impacts, and environmental assessments, is included in the analysis associated with each change to the permit identified above.

II. Applicable Rules and Regulations

The following are partial quotations of some applicable rules and regulations that apply to the operation. The complete rules are stated in the ARM and are available, upon request, from the Department. Upon request, the Department will provide references for locations of complete copies of all applicable rules and regulations, or copies where appropriate.

A. ARM 17.8, Subchapter 1 - General Provisions, including, but not limited to:

1. ARM 17.8.101 Definitions. This rule includes a list of applicable definitions used in this chapter, unless indicated otherwise in a specific subchapter.

2. ARM 17.8.105 Testing Requirements. Any person or persons responsible for the emission of any air contaminant into the outdoor atmosphere shall, upon written request of the Department, provide the facilities and necessary equipment, including instruments and sensing devices, and shall conduct tests, emission or ambient, for such periods of time as may be necessary, using methods approved by the Department.

3. ARM 17.8.106 Source Testing Protocol. The requirements of this rule apply to any emission source testing conducted by the Department, any source, or other entity as required by any rule in this chapter, or any permit or order issued pursuant to this chapter, or the provisions of the Clean Air Act of Montana, 75-2-101, *et seq*., Montana Code Annotated (MCA).

Stillwater shall comply with all requirements contained in the Montana Source Test Protocol and Procedures Manual, including, but not limited to, using the proper test methods and supplying the required reports. A copy of the Montana Source Test Protocol and Procedures Manual is available from the Department upon request.

4. ARM 17.8.110 Malfunctions. (2) The Department must be notified promptly by telephone whenever a malfunction occurs that can be expected to create emissions in excess of any applicable emission limitation or to continue for a period greater than 4 hours.

5. ARM 17.8.111 Circumvention. (1) No person shall cause or permit the installation or use of any device or any means which, without resulting in reduction in the total amount of air contaminant emitted, conceals or dilutes an emission of air contaminant that would otherwise violate an air pollution control regulation. (2) No equipment that may produce emissions shall be operated or maintained in such a manner that a public nuisance is created.

B. ARM 17.8, Subchapter 2 - Ambient Air Quality, including, but not limited to:

1. ARM 17.8.204 Ambient Air Monitoring
2. ARM 17.8.210 Ambient Air Quality Standards for Sulfur Dioxide
3. ARM 17.8.211 Ambient Air Quality Standards for Nitrogen Dioxide
4. ARM 17.8.212 Ambient Air Quality Standards for Carbon Monoxide
5. ARM 17.8.220 Ambient Air Quality Standard for Settled Particulate Matter
6. ARM 17.8.221 Ambient Air Quality Standard for Visibility
7. ARM 17.8.222 Ambient Air Quality Standard for Lead
8. ARM 17.8.223 Ambient Air Quality Standard for PM_{10}

Stillwater shall comply with the applicable ambient air quality standards.

C. ARM 17.8, Subchapter 3 - Emission Standards, including, but not limited to:

1. ARM 17.8.304 Visible Air Contaminants. This rule requires that no person may cause or authorize emissions to be discharged to an outdoor atmosphere from any source installed after November 23, 1968, that exhibit an opacity of 20% or greater averaged over 6 consecutive minutes.

2. ARM 17.8.308 Particulate Matter, Airborne. (1) This rule requires an opacity limitation of 20% for all fugitive emission sources and that reasonable precautions be taken to control emissions of airborne particulate matter. (2) Under this rule, Stillwater shall not cause or authorize the use of any street, road, or parking lot without taking reasonable precautions to control emissions of airborne particulate matter.

3. ARM 17.8.309 Particulate Matter, Fuel Burning Equipment. This rule requires that no person shall cause, allow, or permit to be discharged into the atmosphere particulate matter caused by the combustion of fuel in excess of the amount determined by this rule.

4. ARM 17.8.310 Particulate Matter, Industrial Process. This rule requires that no person shall cause, allow, or permit to be discharged into the atmosphere particulate matter in excess of the amount set forth in this rule.

5. ARM 17.8.322 Sulfur Oxide Emissions--Sulfur in Fuel. Commencing July 1, 1972, no person shall burn liquid or solid fuels containing sulfur in excess of 1 pound of sulfur per million British thermal unit (MMBtu) fired.

6. ARM 17.8.340 Standard of Performance for New Stationary Sources. The owner and operator of any stationary source or modification, as defined and applied in 40 CFR Part 60, shall comply with the standards and provisions of 40 CFR Part 60 as listed below.

   Subpart LL - Standards of Performance for Metallic Mineral Processing Plants is applicable to the facility because the facility meets the definition of a metallic mineral processing plant and was constructed after August 24, 1982. The facility is subject to particulate matter and opacity emission standards and monitoring requirements on the scrubber. Further, the facility is subject to NSPS particulate matter limits for the concentrate dryer venting to smelter circuit #1 and the dried concentrates silo.

   Aspects of 40 CFR 60, Subpart P - Standards of Performance for Primary Copper Smelters relating to the CEMS have been incorporated into the permit. However, Subpart P is not directly applicable to this facility because it does not meet the definition of a primary copper smelter. Stillwater's smelter is sized and designed to process platinum group metals and only produces copper as a by-product.

7. ARM 17.8.341 Emission Standards for Hazardous Air Pollutants. The owner or operator of any existing or new stationary source, as defined and applied in 40 CFR Part 61, shall comply with the standards and provisions of 40 CFR Part 61.

D. ARM 17.8, Subchapter 5 - Air Quality Permit Application, Operation, and Open Burning Fees, including, but not limited to:

1. ARM 17.8.504 Air Quality Permit Application Fees. This rule requires that an applicant submit an air quality permit application fee concurrent with the submittal of an air quality permit application. A permit application is incomplete until the proper application fee is paid to the Department. Stillwater submitted the required permit application fee for the current permit action.

2. ARM 17.8.505 Air Quality Operation Fees. An annual air quality operation fee must, as a condition of continued operation, be submitted to the Department by each source of air contaminants holding an air quality permit, excluding an open burning permit, issued by the Department. This operation fee is based on the actual or estimated actual amount of air pollutants emitted during the previous calendar year.

   An air quality operation fee is separate and distinct from an air quality permit application fee. The annual assessment and collection of the air quality operation fee, described above, shall take place on a calendar-year basis. The Department may insert into any final permit issued after the effective date of these rules, such conditions as may be necessary to require the payment of an air quality operation fee on a calendar-year basis, including provisions that pro-rate the required fee amount.

E. ARM 17.8, Subchapter 7 - Permit, Construction, and Operation of Air Contaminant Sources, including, but not limited to:

1. ARM 17.8.740 Definitions. This rule is a list of applicable definitions used in this chapter, unless indicated otherwise in a specific subchapter.

2. ARM 17.8.743 Montana Air Quality Permits--When Required. This rule requires a facility to obtain an air quality permit or permit modification if they construct, alter or use any air contaminant sources that have the potential to emit greater than 25 tons per year of any pollutant. Stillwater has the potential to emit more than 25 tons per year of particulate matter less than 10 microns (μm) aerodynamic diameter (PM_{10}), sulfur dioxide (SO_2), and oxides of nitrogen (NO_x); therefore, an air quality permit is required.

3. ARM 17.8.744 Montana Air Quality Permits--General Exclusions. This rule identifies the activities that are not subject to the Montana Air Quality Permit program.

4. ARM 17.8.745 Montana Air Quality Permits—Exclusion for De Minimis Changes. This rule identifies the de minimis changes at permitted facilities that are not subject to the Montana Air Quality Permit Program.

5. ARM 17.8.748 New or Modified Emitting Units--Permit Application Requirements. (1) This rule requires that a permit application be submitted prior to installation, modification, or use of a source. Stillwater submitted the required permit application for the current permit action. (7) This rule requires that the applicant notify the public by means of legal publication in a newspaper of general circulation in the area affected by the application for a permit. Stillwater submitted an affidavit of publication of public notice for the February 27, 2003, issue of the Stillwater County News, a newspaper of general circulation in the Town of Columbus, in Stillwater County, as proof of compliance with the public notice requirements.

6. ARM 17.8.749 Conditions for Issuance or Denial of Permit. This rule requires that the permits issued by the Department must authorize the construction and operation of the facility or emitting unit subject to the conditions in the permit and the requirements of this subchapter. This rule also requires that the permit must contain any conditions necessary to assure compliance with the Federal Clean Air Act (FCAA), the Clean Air Act of Montana, and rules adopted under those acts.

7. ARM 17.8.752 Emission Control Requirements. This rule requires a source to install the maximum air pollution control capability that is technically practicable and economically feasible, except that BACT shall be utilized. The required BACT analysis is included in Section V of this permit analysis.

8. ARM 17.8.755 Inspection of Permit. This rule requires that air quality permits shall be made available for inspection by the Department at the location of the source.

9. ARM 17.8.756 Compliance with Other Requirements. This rule states that nothing in the permit shall be construed as relieving Stillwater of the responsibility for complying with any applicable federal or Montana statute, rule, or standard, except as specifically provided in ARM 17.8.740, *et seq*.

10. ARM 17.8.759 Review of Permit Applications. This rule describes the Department's responsibilities for processing permit applications and making permit decisions on those permit applications that do not require the preparation of an environmental impact statement.

11. ARM 17.8.762 Duration of Permit. An air quality permit shall be valid until revoked or modified, as provided in this subchapter, except that a permit issued prior to construction of a new or modified source may contain a condition providing that the permit will expire unless construction is commenced within the time specified in the permit, which in no event may be less than 1 year after the permit is issued.

12. ARM 17.8.763 Revocation of Permit. An air quality permit may be revoked upon written request of the permittee, or for violations of any requirement of the Clean Air Act of Montana, rules adopted under the Clean Air Act of Montana, the FCAA, rules adopted under the FCAA, or any applicable requirement contained in the Montana State Implementation Plan (SIP).

13. ARM 17.8.764 Administrative Amendment to Permit. An air quality permit may be amended for changes in any applicable rules and standards adopted by the Board of Environmental Review (Board) or changed conditions of operation at a source or stack that do not result in an increase of emissions as a result of those changed conditions. The owner or operator of a facility may not increase the facility's emissions beyond permit limits unless the increase meets the criteria in ARM 17.8.745(1) for a de minimis change not requiring a permit, or unless the owner or operator applies for and receives another permit in accordance with ARM 17.8.748, ARM 17.8.749, ARM 17.8.752, ARM 17.8.755, and ARM 17.8.756, and with all applicable requirements in ARM Title 17, Chapter 8, subchapters 8, 9, and 10.

14. ARM 17.8.765 Transfer of Permit. This rule states that an air quality permit may be transferred from one person to another if written notice of Intent to Transfer, including the names of the transferor and the transferee, is sent to the Department.

F. ARM 17.8, Subchapter 8 - Prevention of Significant Deterioration of Air Quality, including, but not limited to:

1. ARM 17.8.801 Definitions. This rule is a list of applicable definitions used in this subchapter.

2. ARM 17.8.818 Review of Major Stationary Sources and Major Modifications--Source Applicability and Exemptions. The requirements contained in ARM 17.8.819 through ARM 17.8.827 shall apply to any major stationary source and any major modification, with respect to each pollutant subject to regulation under the FCAA that it would emit, except as this subchapter would otherwise allow. This facility is not a major stationary source since this facility is not a listed source and the facility's potential to emit is below 250 tons per year of any pollutant (excluding fugitive emissions).

G. ARM 17.8, Subchapter 12 - Operating Permit Program Applicability, including, but not limited to:

1. ARM 17.8.1201 Definitions. (23) Major Source under Section 7412 of the FCAA is defined as any stationary source having:

a. PTE > 100 tons/year of any pollutant;

b. PTE > 10 tons/year of any one Hazardous Air Pollutant (HAP), or PTE > 25 tons/year of a combination of all HAPs, or lesser quantity as the Department may establish by rule; or

c. PTE > 70 tons/year of PM_{10} in a serious PM_{10} nonattainment area.

2. ARM 17.8.1204 Air Quality Operating Permit Program Applicability. Title V of the FCAA Amendments of 1990 requires that all sources, as defined in ARM 17.8.1204 (1), obtain a Title V Operating Permit. In reviewing and issuing Air Quality Permit #2635-10 for Stillwater, the following conclusions were made:

a. The facility's permitted PTE is less than 100 tons/year for any pollutant.

b. The facility's PTE is less than 10 tons/year for any one HAP and less than 25 tons/year for all HAPs.

c. This source is not located in a serious PM_{10} nonattainment area.

d. This facility is subject to 40 CFR 60, Subpart LL, as applicable.

e. This facility is not subject to any current NESHAP standards.

f. This source is not a Title IV affected source, nor a solid waste combustion unit.

g. This source is not an EPA designated Title V source.

Stillwater's Permit #2635-10 includes federally enforceable limits that allow the facility to stay below the Title V Operating Permit threshold. Therefore, the facility is considered a minor source of emissions, as defined under the Title V Operating Permit Program, and is not required to obtain a Title V Operating Permit.

h. ARM 17.8.1204(3). The Department may exempt a source from the requirement to obtain an air quality operating permit by establishing federally enforceable limitations that limit the source's potential to emit.

i. In applying for an exemption under this section, the owner or operator of the source shall certify to the Department that the source's potential to emit does not require the source to obtain an air quality operating permit.

ii. Any source that obtains a federally enforceable limit on potential to emit shall annually certify that its actual emissions are less than those that would require the source to obtain an air quality operating permit.

The Department determined that the annual reporting requirements contained in the permit are sufficient to satisfy this requirement.

3. ARM 17.8.1207 Certification of Truth, Accuracy, and Completeness. The compliance certification submittal required by ARM 17.8.1204(3) shall contain certification by a responsible official of truth, accuracy, and completeness. This

certification and any other certification required under this subchapter shall state that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

III. Emission Inventory

Existing Potential To Emit (PTE)	**Ton/yr**					
Emission Source	**PM**	**PM_{10}**	**SO_2**	**NO_x**	**CO**	**VOC**
Smelter #1 PM_{10} Process Emissions	0.00	10.90	0.00	0.00	0.00	0.00
Smelter #1 SO_2 Process Emissions	0.00	0.00	22.77	0.00	0.00	0.00
Smelter #1 Propane Use Emissions	0.00	0.04	0.01	1.14	0.19	0.03
Smelter #1 Nat. Gas Use Emissions	0.00	0.04	0.00	0.50	0.42	0.03
Soda Ash Silo (Smelter #1)	0.05	0.03	0.00	0.00	0.00	0.00
*** Limestone Flux Feed System (Smelter #1)	0.12	0.06	NA	NA	NA	NA
*** Pebble Lime Feed System (Smelter #1)	0.04	0.02	0.00	0.00	0.00	0.00
Hydrated Lime Silo (Smelter #1)	1.65	0.82	0.00	0.00	0.00	0.00
Smelter #2 Process PM_{10} Emissions	0.00	33.04	0.00	0.00	0.00	0.00
Smelter #2 Process SO_2 Emissions	0.00	0.00	73.36	0.00	0.00	0.00
Smelter #2 Nat. Gas Use Emissions	0.00	0.34	0.03	4.50	3.78	0.25
******* Limestone Flux Bin (Smelter #2)	NA	NA	NA	NA	NA	NA
*** Pebble Lime Feed System (Smelter #2)	0.24	0.12	0.00	0.00	0.00	0.00
Hydrated Lime Silo (Smelter #2)	2.93	1.44	0.00	0.00	0.00	0.00
Gypsum Dumping and Loading	3.00	1.50	0.00	0.00	0.00	0.00
Ore Dump and Handling (Slag Pit Liner)	4.80	2.40	0.00	0.00	0.00	0.00
Haul Roads	2.74	1.23	0.00	0.00	0.00	0.00
* Conc. Dryer PM_{10} Process Emission	NA	NA	NA	NA	NA	NA
Natural Gas Use: Concentrate Dryer	NA	0.22	0.02	2.95	2.48	0.16
NSC Dryer Process PM_{10} Emissions	NA	1.09	0.00	0.00	0.00	0.00
Natural Gas Use: NSC Dryer	NA	0.03	0.00	0.34	0.29	0.02
Dried Concentrates Silo	NA	2.21	0.00	0.00	0.00	0.00
Smelter Emergency Generator #1 (600 kw)	NA	0.44	0.41	6.24	1.34	0.50
Smelter Emergency Generator #2 (600 kw)	NA	0.44	0.41	6.24	1.34	0.50
Refinery Natural Gas Fired Emergency Generator	NA	0.00	0.00	0.03	0.02	0.00
New N.G. Fired Boiler (15 MMBtu/hr)	NA	0.50	0.04	6.57	5.52	0.36
Fire Assay Area Baghouse	7.19	7.19	0.00	0.00	0.00	0.00
******* Fire Assay Area Fume Hoods (6)	NA	NA	NA	NA	NA	NA
*** Security Area Baghouse	NA	0.12	0.00	0.00	0.00	0.00
*** Sample Prep Area Baghouse	NA	0.99	0.00	0.00	0.00	0.00
*** Sample Preparation Dryer #1	NA	0.002	0.0002	0.031	0.026	0.002
*** Sample Preparation Dryer #2	NA	0.003	0.0003	0.044	0.037	0.002
******* Sample Prep Fume Hoods (4)	NA	NA	NA	NA	NA	NA
Nickel Sulfate Bagging Unit Baghouse	0.23	0.23	0.00	0.00	0.00	0.00
Smelter Slag Material Transfer	7.20	3.60	0.00	0.00	0.00	0.00
**** Mobile Gasoline Use	NA	NA	NA	NA	NA	NA
**** Mobile Diesel Use	NA	NA	NA	NA	NA	NA
** EF Matte/TBRC Slag Dryer	NA	NA	NA	NA	NA	NA
** TBRC Matte Dryer	NA	NA	NA	NA	NA	NA
***** Refinery Main Scrubber	NA	NA	NA	NA	NA	NA
***** Refinery Electrowin Scrubber	NA	NA	NA	NA	NA	NA
***** SO_2 Hygiene Fan	NA	NA	NA	NA	NA	NA
***** Granulator	NA	NA	NA	NA	NA	NA
* Revert Crushing Area	NA	NA	NA	NA	NA	NA
*** 30-ton Concentrate Dryer Feed Hopper	0.02	0.01	0.01	0.00	0.00	0.00
*** 40-ton #2 Dried Concentrates Bin	NA	0.038	NA	NA	NA	NA
*** Dust Bin	NA	0.011	NA	NA	NA	NA
*** Secondaries/Iron Residue Bin	0.05	0.02	0.00	0.00	0.00	0.00
*** TBRC Slag Bin	0.04	0.02	0.00	0.00	0.00	0.00
*** EF Matte Bins (4)	0.09	0.05	0.00	0.00	0.00	0.00
** Security Area Electric Dryers	NA	NA	NA	NA	NA	NA
Moffit Indoor Smelter Building Heaters (2)	NA	0.32	0.03	4.20	3.53	0.23
Circular Refinery Building Heater	NA	0.04	0.003	0.53	0.44	0.03
*** Secondary Preparation Building	NA	1.49	0.00	0.00	0.00	0.00
****** Refinery Lab Scrubbers (2)	NA	NA	NA	NA	NA	NA
Total Facility PTE	**30.39**	**71.04**	**97.08**	**33.30**	**19.42**	**2.11**

* Process PM_{10} emissions from these sources are not counted in the total facility PTE because these emissions are routed through smelter circuit #1 and have already been accounted for in smelter #1 emission inventory.

** Process PM_{10} emissions from these sources are not counted in the total facility PTE because these emissions are routed through smelter circuit #2 and have already been accounted for in smelter #2 emission inventory.
*** Emissions vent or are contained inside building; therefore, a 90% control factor is applied to source.
**** Mobile emission sources are insignificant at this facility.
***** No particulate in process: insignificant vapor mist emissions only.
****** No particulate emissions: insignificant acid gas emissions only.
******* Emissions vent to permitted stack and have already been accounted for in emission inventory.

- Emission Calculations are based on an annual concentrate/platinum group metals (PGM) catalyst throughput of 11,500 ton/yr for smelter circuit #1 and 37,050 ton/yr for smelter circuit #2. The throughput is limited by permit to a maximum combined limit of 48,550 ton/yr through smelter circuit #1 and smelter circuit #2.

Smelter #1 Process PM Emissions

Emission Factor: 0.011 gr/dscf (permit limit)
Hours of Operation: 8760 hr/yr
Baghouse Flowrate Capacity: 26,404 dscfm

PM_{10} Emissions

0.011 gr/dscf * 26404 dscfm * 60 min/hr * 8760 hr/yr * 1 lb/7000 gr * 0.0005 ton/lb = 10.90 ton/yr

- Assume all PM emissions are PM_{10}

Smelter #1 Process SO_2 Emissions

Material Handled: 11,500 ton/yr (permit limit)
Control Efficiency – Scrubber: 99.1% (assumed)
Sulfur Content: 11%

SO_2 Emissions

11,500 ton/yr * 11% S * 2 lb SO2/ 1lb S * ((100% - 99.1%) /100)) = 22.77 ton/yr

Smelter #1 Propane Use Emissions

Maximum Annual Use: 120,000 gallons

PM_{10} Emissions

Emission Factor: 0.6 lb/1000 gallons (AP-42, Table 1.5-1, 10/96)
Calculations: 120,000 gal/yr * 0.6 lb/1000 gal * 0.0005 ton/lb = 0.036 ton/yr

- Assume all PM emissions are PM_{10}

SO_2 Emissions

Emission Factor: 0.1 lb/1000 gallons (AP-42, Table 1.5-1, 10/96)
Calculations: 120,000 gal/yr * 0.1 lb/1000 gal * 0.0005 ton/lb = 0.006 ton/yr

NO_x Emissions

Emission Factor: 19 lb/1000 gallons (AP-42, Table 1.5-1, 10/96)
Calculations: 120,000 gal/yr * 19 lb/1000 gal * 0.0005 ton/lb = 1.14 ton/yr

CO Emissions

Emission Factor: 3.2 lb/1000 gallons (AP-42, Table 1.5-1, 10/96)
Calculations: 120,000 gal/yr * 3.2 lb/1000 gal * 0.0005 ton/lb = 0.19 ton/yr

VOC Emissions

Emission Factor: 0.5 lb/1000 gallons (AP-42, Table 1.5-1, 10/96)
Calculations: 120,000 gal/yr * 0.5 lb/1000 gal * 0.0005 ton/lb = 0.03 ton/yr

Smelter #1 Natural Gas Use Emissions

Maximum Use: 10 MMcuft/yr

PM_{10} Emissions

Emission Factor: 7.6 lb/MMcuft (AP-42 Table 1.4-2, 02/98)
Calculations: 7.6 lb/MMcuft * 10 MMcuft/yr * 0.0005 ton/lb = 0.038 ton/yr

- Assume all PM emissions are PM_{10}

SO_2 Emissions

Emission Factor: 0.6 lb/MMcuft (AP-42 Table 1.4-2, 02/98)
Calculations: 0.6 lb/MMcuft * 10 MMcuft/yr * 0.0005 ton/lb = 0.003 ton/yr

NO_x Emissions

Emission Factor: 100 lb/MMcuft (AP-42 Table 1.4-2, 02/98)
Calculations: 100 lb/MMcuft * 10 MMcuft/yr * 0.0005 ton/lb = 0.5 ton/yr

CO Emissions

Emission Factor: 84 lb/MMcuft (AP-42 Table 1.4-2, 02/98)
Calculations: 84 lb/MMcuft * 10 MMcuft/yr * 0.0005 ton/lb = 0.42 ton/yr

VOC Emissions

Emission Factor: 5.5 lb/MMcuft (AP-42 Table 1.4-2, 02/98)
Calculations: 5.5 lb/MMcuft * 10 MMcuft/yr * 0.0005 ton/lb = 0.028 ton/yr

Soda Ash Silo (Smelter #1)

Max. Material Handled: 540 ton/yr

PM Emissions

Emission Factor: 0.2 lb/ton (DEQ Emission Factor)
Calculations: 0.2 lb/ton * 540 ton/yr * 0.0005 ton/lb = 0.054 ton/yr

PM_{10} Emissions

Emission Factor: 0.1 lb/ton (Assume 50% 0f PM is PM_{10})
Calculations: 0.1 lb/ton * 540 ton/yr * 0.0005 ton/lb = 0.027 ton/yr

*** Limestone Flux Feed System (Smelter #1)

Max. Material Handled: 1100 ton/yr
Control Efficiency: 90% (Building Enclosure)

PM Emissions

Emission Factor: 2.20 lb/ton (AP-42 Table 11.17-4, 02/98)
Calculations: 2.20 lb/ton * 1100 ton/yr * 0.0005 ton/lb * (1-0.9) = 0.121 ton/yr
PM_{10} Emissions

Emission Factor: 1.10 lb/ton (Assume 50% of PM is PM_{10})
Calculations: 1.10 lb/ton * 1100 ton/yr * 0.0005 ton/lb * (1-0.9) = 0.061 ton/yr

*** Pebble Lime Feed System (Smelter #1)

Max. Material Handled: 350 ton/yr
Control Efficiency: 90% (Building Enclosure)

PM Emissions

Emission Factor: 2.20 lb/ton (AP-42 Table 11.17-4, 02/98)
Calculations: 2.20 lb/ton * 350 ton/yr * 0.0005 ton/lb * (1-0.9) = 0.04 ton/yr

PM_{10} Emissions

Emission Factor: 1.10 lb/ton (Assume 50% of PM is PM_{10})
Calculations: 1.10 lb/ton * 350 ton/yr * 0.0005 ton/lb * (1-0.9) = 0.02 ton/yr

Hydrated Lime Silo (Smelter #1)

Max. Material Handled: 5400 ton/yr

PM Emissions

Emission Factor: 0.61 lb/ton (AP-42 Table 11.17-4, 02/98)
Calculations: 0.61 lb/ton * 5400 ton/yr * 0.0005 ton/lb = 1.65 ton/yr

PM_{10} Emissions

Emission Factor: 0.305 lb/ton (Assume 50% of PM is PM_{10})
Calculations: 0.305 lb/ton * 5400 ton/yr * 0.0005 ton/lb = 1.65 ton/yr

Smelter #2 Process PM Emissions

Emission Factor: 0.011 gr/dscf (permit limit)
Hours of Operation: 8760 hr/yr
BaghouseFlowrate Capacity: 80,012 dscfm

PM_{10} Emissions

0.011 gr/dscf * 80,012 dscfm * 60 min/hr * 8760 hr/yr * 1 lb/7000 gr * 0.0005 ton/lb = 33.04 ton/yr

- Assume all PM emissions are PM_{10}

Smelter #2 Process SO_2 Emissions

Material Handled: 37,050 ton/yr (permit limit)
Control Efficiency – Scrubber: 99.1% (assumed)
Sulfur Content: 11%

SO_2 Emissions

11,500 ton/yr * 11% S * 2 lb SO2/ 1lb S * ((100% - 99.1%) /100)) = 73.36 ton/yr

Smelter #2 Natural Gas Use Emissions

Maximum Use: 90 MMcuft/yr
PM_{10} Emissions

Emission Factor: 7.6 lb/MMcuft (AP-42 Table 1.4-2, 02/98)
Calculations: 7.6 lb/MMcuft * 90 MMcuft/yr * 0.0005 ton/lb = 0.342 ton/yr

- Assume all PM emissions are PM_{10}

SO_2 Emissions

Emission Factor: 0.6 lb/MMcuft (AP-42 Table 1.4-2, 02/98)
Calculations: 0.6 lb/MMcuft * 90 MMcuft/yr * 0.0005 ton/lb = 0.027 ton/yr

NO_x Emissions

Emission Factor: 100 lb/MMcuft (AP-42 Table 1.4-2, 02/98)
Calculations: 100 lb/MMcuft * 90 MMcuft/yr * 0.0005 ton/lb = 4.5 ton/yr

CO Emissions

Emission Factor: 84 lb/MMcuft (AP-42 Table 1.4-2, 02/98)
Calculations: 84 lb/MMcuft * 90 MMcuft/yr * 0.0005 ton/lb = 3.78 ton/yr

VOC Emissions

Emission Factor: 5.5 lb/MMcuft (AP-42 Table 1.4-2, 02/98)
Calculations: 5.5 lb/MMcuft * 90 MMcuft/yr * 0.0005 ton/lb = 0.248 ton/yr

******* Limestone Flux Bin (Smelter #2)

- Emissions routed to Dust Bin baghouse and are already accounted for in emission inventory.

*** Pebble Lime Feed System (Smelter #2)

Max. Material Handled: 2200 ton/yr
Control Efficiency: 90% (Building Enclosure)

PM Emissions

Emission Factor: 2.20 lb/ton (AP-42 Table 11.17-4, 02/98)
Calculations: 2.20 lb/ton * 2200 ton/yr * 0.0005 ton/lb * (1-0.9) = 0.24 ton/yr

PM_{10} Emissions

Emission Factor: 1.10 lb/ton (Assume 50% of PM is PM_{10})
Calculations: 1.10 lb/ton * 2200 ton/yr * 0.0005 ton/lb * (1-0.9) = 0.12 ton/yr

Hydrated Lime Silo (Smelter #2)

Max. Material Handled: 9600 ton/yr

PM Emissions

Emission Factor: 0.61 lb/ton (AP-42 Table 11.17-4, 02/98)
Calculations: 0.61 lb/ton * 9600 ton/yr * 0.0005 ton/lb = 2.93 ton/yr

PM_{10} Emissions

Emission Factor: 0.305 lb/ton (Assume 50% of PM is PM_{10})
Calculations: 0.305 lb/ton * 9600 ton/yr * 0.0005 ton/lb = 1.46 ton/yr

Gypsum Dumping and Loading Emissions

Max. Material Handled: 25,000 ton/yr

Transfer Points: 2 Transfers

PM Emissions

Emission Factor: 0.12 lb/ton (AP-42 Table 11.24-2, 01/95)
Calculations: 0.12 lb/ton * 25,000 ton/yr * 2 Transfers * 0.0005 ton/lb = 3.00 ton/yr

PM_{10} Emissions

Emission Factor: 0.06 lb/ton (AP-42 Table 11.24-2, 01/95)
Calculations: 0.06 lb/ton * 25,000 ton/yr * 2 Transfers * 0.0005 ton/lb = 1.5 ton/yr

Ore Dump and Handling (Slag Pit Lining)

Max. Material Handled: 40,000 ton/yr (Company Information)
Transfer Points: 2 Transfers

PM Emissions

Emission Factor: 0.12 lb/ton (AP-42 Table 11.24-2, 01/95)
Calculations: 0.12 lb/ton * 40,000 ton/yr * 2 Transfers * 0.0005 ton/lb = 4.8 ton/yr

PM_{10} Emissions

Emission Factor: 0.06 lb/ton (AP-42 Table 11.24-2, 01/95)
Calculations: 0.06 lb/ton * 40,000 ton/yr * 2 Transfers * 0.0005 ton/lb = 2.4 ton/yr

Haul Roads

Vehicle Miles Traveled: 5 VMT/day (estimate)
Control Efficiency: 50% (watering and or chemical dust suppressant)

PM Emissions

Emission Factor: 6 lb/VMT (AP-42 Section 11.2.1)
Calculations: 5 VMT/day * 6 lb/VMT * 365 day/yr * 0.0005 ton/lb * (50%) = 2.74 ton/yr

PM_{10} Emissions

Emission Factor: 2.7 lb/VMT (AP-42 Section 11.2.1)
Calculations: 5 VMT/day * 2.7 lb/VMT * 365 day/yr * 0.0005 ton/lb * (50%) = 1.23 ton/yr

* Concentrate Dryer PM Process Emissions

- Process PM_{10} Emissions are not counted in the total facility PTE because emissions from these sources are routed to smelter circuit #1 baghouse and emissions have already been counted for that source.

Concentrate Dryer Natural Gas Use Emissions

Maximum Use: 59 MMcuft/yr

PM_{10} Emissions

Emission Factor: 7.6 lb/MMcuft (AP-42 Table 1.4-2, 02/98)
Calculations: 7.6 lb/MMcuft * 59 MMcuft/yr * 0.0005 ton/lb = 0.22 ton/yr

- Assume all PM emissions are PM_{10}

SO_2 Emissions

Emission Factor: 0.6 lb/MMcuft (AP-42 Table 1.4-2, 02/98)

Calculations: 0.6 lb/MMcuft * 59 MMcuft/yr * 0.0005 ton/lb = 0.018 ton/yr

NO_x Emissions

Emission Factor: 100 lb/MMcuft (AP-42 Table 1.4-2, 02/98)
Calculations: 100 lb/MMcuft * 59 MMcuft/yr * 0.0005 ton/lb = 2.95 ton/yr

CO Emissions

Emission Factor: 84 lb/MMcuft (AP-42 Table 1.4-2, 02/98)
Calculations: 84 lb/MMcuft * 59 MMcuft/yr * 0.0005 ton/lb = 2.48 ton/yr

VOC Emissions

Emission Factor: 5.5 lb/MMcuft (AP-42 Table 1.4-2, 02/98)
Calculations: 5.5 lb/MMcuft * 59 MMcuft/yr * 0.0005 ton/lb = 0.16 ton/yr

NSC Dryer Process PM_{10} Emissions

Emission Factor: 0.022 gr/dscf
Hours of Operation: 8760 hr/yr
Baghouse Airflow: 1318 dscfm

PM_{10} Emissions

0.022 gr/dscf * 1318 dscfm * 60 min/hr * 8760 hr/yr * 1 lb/7000 gr * 0.0005 ton/lb = 1.09 ton/yr

- Assume all PM emissions are PM_{10}

NSC Dryer Natural Gas Use Emissions

Maximum Use: 6.8 MMcuft/yr

PM_{10} Emissions

Emission Factor: 7.6 lb/MMcuft (AP-42 Table 1.4-2, 02/98)
Calculations: 7.6 lb/MMcuft * 6.8 MMcuft/yr * 0.0005 ton/lb = 0.026 ton/yr

- Assume all PM emissions are PM_{10}

SO_2 Emissions

Emission Factor: 0.6 lb/MMcuft (AP-42 Table 1.4-2, 02/98)
Calculations: 0.6 lb/MMcuft * 6.8 MMcuft/yr * 0.0005 ton/lb = 0.002 ton/yr

NO_x Emissions

Emission Factor: 100 lb/MMcuft (AP-42 Table 1.4-2, 02/98)
Calculations: 100 lb/MMcuft * 6.8 MMcuft/yr * 0.0005 ton/lb = 0.340 ton/yr

CO Emissions

Emission Factor: 84 lb/MMcuft (AP-42 Table 1.4-2, 02/98)
Calculations: 84 lb/MMcuft * 6.8 MMcuft/yr * 0.0005 ton/lb = 0.286 ton/yr

VOC Emissions

Emission Factor: 5.5 lb/MMcuft (AP-42 Table 1.4-2, 02/98)

Calculations: 5.5 lb/MMcuft * 6.8 MMcuft/yr * 0.0005 ton/lb = 0.019 ton/yr

Dried Concentrates Silo PM Emissions

Emission Factor: 0.022 gr/dscf (40 CFR 60, Subpart LL)
Hours of Operation: 8760 hr/yr
Baghouse Flowrate Capacity: 2671 dscfm (manufacturer's information)

PM_{10} Emissions

0.022 gr/dscf * 2671 dscfm * 60 min/hr * 8760 hr/yr * 1 lb/7000 gr * 0.0005 ton/lb = 2.21 ton/yr

- Assume all PM emissions are PM_{10}

Smelter Emergency Diesel Generator #1 Emissions

Generator Capacity: 600 kilowatts or 804.6 horsepower
Hours of Operation: 500 hr/yr (permit limit)

PM_{10} Emissions

Emission Factor: 0.0022 lb/hp-hr (AP-42 Table 3.3-1, 07/95)
Calculations: 0.0022 lb/hp-hr * 804.6 hp * 500 hr/yr * 0.0005 ton/lb = 0.44 ton/yr

- Assume all PM emissions are PM_{10}

SO_2 Emissions

Emission Factor: 0.00205 lb/hp-hr (AP-42 Table 3.3-1, 07/95)
Calculations: 0.00205 lb/hp-hr * 804.6 hp * 500 hr/yr * 0.0005 ton/lb = 0.41 ton/yr

NO_x Emissions

Emission Factor: 0.0310 lb/hp-hr (AP-42 Table 3.3-1, 07/95)
Calculations: 0.0310 lb/hp-hr * 804.6 hp * 500 hr/yr * 0.0005 ton/lb = 6.24 ton/yr

CO Emissions

Emission Factor: 0.00668 lb/hp-hr (AP-42 Table 3.3-1, 07/95)
Calculations: 0.00668 lb/hp-hr * 804.6 hp * 500 hr/yr * 0.0005 ton/lb = 1.34 ton/yr

VOC Emissions

Emission Factor: 0.00247 lb/hp-hr (AP-42 Table 3.3-1, 07/95)
Calculations: 0.00247 lb/hp-hr * 804.6 hp * 500 hr/yr * 0.0005 ton/lb = 0.50 ton/yr

Smelter Emergency Diesel Generator #2 Emissions

Generator Capacity: 600 kilowatts or 804.6 horsepower
Hours of Operation: 500 hr/yr (permit limit)

PM_{10} Emissions

Emission Factor: 0.0022 lb/hp-hr (AP-42 Table 3.3-1, 07/95)
Calculations: 0.0022 lb/hp-hr * 804.6 hp * 500 hr/yr * 0.0005 ton/lb = 0.44 ton/yr

- Assume all PM emissions are PM_{10}

SO_2 Emissions

Emission Factor: 0.00205 lb/hp-hr (AP-42 Table 3.3-1, 07/95)
Calculations: 0.00205 lb/hp-hr * 804.6 hp * 500 hr/yr * 0.0005 ton/lb = 0.41 ton/yr

NO_x Emissions

Emission Factor: 0.0310 lb/hp-hr (AP-42 Table 3.3-1, 07/95)
Calculations: 0.0310 lb/hp-hr * 804.6 hp * 500 hr/yr * 0.0005 ton/lb = 6.24 ton/yr

CO Emissions

Emission Factor: 0.00668 lb/hp-hr (AP-42 Table 3.3-1, 07/95)
Calculations: 0.00668 lb/hp-hr * 804.6 hp * 500 hr/yr * 0.0005 ton/lb = 1.34 ton/yr

VOC Emissions

Emission Factor: 0.00247 lb/hp-hr (AP-42 Table 3.3-1, 07/95)
Calculations: 0.00247 lb/hp-hr * 804.6 hp * 500 hr/yr * 0.0005 ton/lb = 0.50 ton/yr

Refinery Natural Gas Fired Emergency Generator Emissions

Hours of Operation: 500 hr/yr (permit limit)
Max. fuel Combustion: 0.001 MMscf/hr (company information)

PM_{10} Emissions

Emission Factor: 7.6 lb/MMcuft (AP-42 Table 1.4-2, 02/98)
Calculations: 7.6 lb/MMcuft * 0.001 MMscf/hr * 500 hr/yr * 0.0005 ton/lb = 0.002 ton/yr
Assume all PM emissions are PM_{10}

SO_2 Emissions

Emission Factor: 0.6 lb/MMcuft (AP-42 Table 1.4-2, 02/98)
Calculations: 0.6 lb/MMcuft * 0.001 MMscf/hr * 500 hr/yr * 0.0005 ton/lb = 0.000 ton/yr

NO_x Emissions

Emission Factor: 100 lb/MMcuft (AP-42 Table 1.4-2, 02/98)
Calculations: 100 lb/MMcuft * 0.001 MMscf/hr * 500 hr/yr * 0.0005 ton/lb = 0.025 ton/yr

CO Emissions

Emission Factor: 84 lb/MMcuft (AP-42 Table 1.4-2, 02/98)
Calculations: 84 lb/MMcuft * 0.001 MMscf/hr * 500 hr/yr * 0.0005 ton/lb = 0.021 ton/yr

VOC Emissions

Emission Factor: 5.5 lb/MMcuft (AP-42 Table 1.4-2, 02/98)
Calculations: 5.5 lb/MMcuft * 0.001 MMscf/hr * 500 hr/yr * 0.0005 ton/lb = 0.001 ton/yr

New Natural Gas Fired Boiler (15 MMBtu/hr)

Hours of Operation: 8760 hr/yr
Max Fuel Combustion: 15 MMBtu/hr
Fuel Heating Value: 0.001 MMscf/MMBtu

PM_{10} Emissions

Emission Factor: 7.6 lb/MMcuft (AP-42 Table 1.4-2, 02/98)
Calculations: 7.6 lb/MMcuft * 0.001 MMscf/MMBtu * 15 MMBtu/hr = 0.11 lb/hr
0.11 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.50 ton/yr

- Assume all PM emissions are PM_{10}

SO_2 Emissions

Emission Factor: 0.6 lb/MMcuft (AP-42 Table 1.4-2, 02/98)
Calculations: 0.6 lb/MMcuft * 0.001 MMscf/MMBtu * 15 MMBtu/hr = 0.01 lb/hr
0.01 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.04 ton/yr

NO_x Emissions

Emission Factor: 100 lb/MMcuft (AP-42 Table 1.4-2, 02/98)
Calculations: 100 lb/MMcuft * 0.001 MMscf/MMBtu * 15 MMBtu/hr = 1.50 lb/hr
0.86 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 6.57 ton/yr

CO Emissions

Emission Factor: 84 lb/MMcuft (AP-42 Table 1.4-2, 02/98)
Calculations: 84 lb/MMcuft * 0.001 MMscf/MMBtu * 15 MMBtu/hr = 1.26 lb/hr
0.72 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 5.52 ton/yr

VOC Emissions

Emission Factor: 5.5 lb/MMcuft (AP-42 Table 1.4-2, 02/98)
Calculations: 5.5 lb/MMcuft * 0.001 MMscf/MMBtu * 15 MMBtu/hr = 0.08 lb/hr
0.05 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.36 ton/yr

Fire Assay Area Baghouse Emissions

Emission Factor: 0.022 gr/dscf (40 CFR 60, Subpart LL)
Hours of Operation: 8760 hr/yr
Baghouse Flowrate Capacity: 8700 dscfm (manufacturer's information)

PM Emissions

0.022 gr/dscf * 8700 dscfm * 60 min/hr * 8760 hr/yr * 1 lb/7000 gr * 0.0005 ton/lb = 7.19 ton/yr

PM_{10} Emissions

0.022 gr/dscf * 8700 dscfm * 60 min/hr * 8760 hr/yr * 1 lb/7000 gr * 0.0005 ton/lb = 7.19 ton/yr

******* Fire Assay Area Fume Hoods (6)

- Emissions vent to fire assay area baghouse and have already been accounted for in Fire Assay Baghouse emission inventory.

*** Security Area Baghouse Emissions

Emission Factor: 0.022 gr/dscf (40 CFR 60, Subpart LL)
Hours of Operation: 8760 hr/yr
Baghouse Flowrate Capacity: 1450 dscfm (manufacturer's information)
Control Efficiency: 90% (Building Enclosure)

PM Emissions

- Assume all PM emissions are PM_{10}

PM_{10} Emissions

0.022 gr/dscf * 1450 dscfm * 60 min/hr * 8760 hr/yr * 1 lb/7000 gr * 0.0005 ton/lb * (1-0.9) = 0.12 ton/yr

*** Sample Preparation Area Baghouse Emissions

Emission Factor:	0.022 gr/dscf (40 CFR 60, Subpart LL)
Hours of Operation:	8760 hrs/yr
Baghouse Flowrate Capacity:	12,000 dscfm (manufacturer's information)
Control Efficiency:	90% (Building Enclosure)

PM Emissions

- Assume all PM emissions are PM_{10}

PM_{10} Emissions

0.022 gr/dscf * 12000 dscfm * 60 min/hr * 8760 hr/yr * 1 lb/7000 gr * 0.0005 ton/lb * (1-0.9) = 0.99 ton/yr

*** Sample Preparation Dryer #1

Hours of Operation:	8760 hr/yr
Max Fuel Combustion:	0.07 MMBtu/hr
Fuel Heating Value:	0.001 MMscf/MMBtu

PM_{10} Emissions

Emission Factor:	7.6 lb/MMcuft (AP-42 Table 1.4-2, 02/98)
Calculations:	7.6 lb/MMcuft * 0.001 MMscf/MMBtu * 0.07 MMBtu/hr = 0.0005 lb/hr
	0.0005 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.002 ton/yr

- Assume all PM emissions are PM_{10}

SO_2 Emissions

Emission Factor:	0.6 lb/MMcuft (AP-42 Table 1.4-2, 02/98)
Calculations:	0.6 lb/MMcuft * 0.001 MMscf/MMBtu * 0.07 MMBtu/hr = 0.00 lb/hr
	0.00 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.00 ton/yr

NO_x Emissions

Emission Factor:	100 lb/MMcuft (AP-42 Table 1.4-2, 02/98)
Calculations:	100 lb/MMcuft * 0.001 MMscf/MMBtu * 0.07 MMBtu/hr = 0.007 lb/hr
	0.007 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.031 ton/yr

CO Emissions

Emission Factor:	84 lb/MMcuft (AP-42 Table 1.4-2, 02/98)
Calculations:	84 lb/MMcuft * 0.001 MMscf/MMBtu * 0.07 MMBtu/hr = 0.0059 lb/hr
	0.0059 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.026 ton/yr

VOC Emissions

Emission Factor:	5.5 lb/MMcuft (AP-42 Table 1.4-2, 02/98)
Calculations:	5.5 lb/MMcuft * 0.001 MMscf/MMBtu * 0.07 MMBtu/hr = 0.0004 lb/hr
	0.0004 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.002 ton/yr

*** Sample Preparation Dryer #2

Hours of Operation:	8760 hr/yr
Max Fuel Combustion:	0.10 MMBtu/hr
Fuel Heating Value:	0.001 MMscf/MMBtu

PM_{10} Emissions

Emission Factor: 7.6 lb/MMcuft (AP-42 Table 1.4-2, 02/98)
Calculations: 7.6 lb/MMcuft * 0.001 MMscf/MMBtu * 0.10 MMBtu/hr = 0.0008 lb/hr
0.0008 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.003 ton/yr

- Assume all PM emissions are PM_{10}

SO_2 Emissions

Emission Factor: 0.6 lb/MMcuft (AP-42 Table 1.4-2, 02/98)
Calculations: 0.6 lb/MMcuft * 0.001 MMscf/MMBtu * 0.10 MMBtu/hr = 0.0001 lb/hr
0.0001 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.00 ton/yr

NO_x Emissions

Emission Factor: 100 lb/MMcuft (AP-42 Table 1.4-2, 02/98)
Calculations: 100 lb/MMcuft * 0.001 MMscf/MMBtu * 0.10 MMBtu/hr = 0.01 lb/hr
0.01 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.044 ton/yr

CO Emissions

Emission Factor: 84 lb/MMcuft (AP-42 Table 1.4-2, 02/98)
Calculations: 84 lb/MMcuft * 0.001 MMscf/MMBtu * 0.10 MMBtu/hr = 0.0084 lb/hr
0.0084 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.037 ton/yr

VOC Emissions

Emission Factor: 5.5 lb/MMcuft (AP-42 Table 1.4-2, 02/98)
Calculations: 5.5 lb/MMcuft * 0.001 MMscf/MMBtu * 0.10 MMBtu/hr = 0.0004 lb/hr
0.0004 lb/hr * 8760 hr/yr * 0.0005 ton/lb = 0.002 ton/yr

******* Sample Preparation Area Fume Hoods (4)

- Emissions are routed to Sample Preparation Area Baghouse and are already accounted for in emission inventory.

Nickel Sulfate Bagging Unit Baghouse Emissions

Emission Factor: 0.022 gr/dscf (40 CFR 60, Subpart LL)
Hours of Operation: 8760 hr/yr
Baghouse Flowrate Capacity: 276 dscfm (manufacturer's information)

PM Emissions

0.022 gr/dscf * 276 dscfm * 60 min/hr * 8760 hr/yr * 1 lb/7000 gr * 0.0005 ton/lb = 0.23 ton/yr

PM_{10} Emissions

0.022 gr/dscf * 276 dscfm * 60 min/hr * 8760 hr/yr * 1 lb/7000 gr * 0.0005 ton/lb = 0.23 ton/yr

Smelter Slag Material Transfer Emissions

Max. Material Handled: 60,000 ton/yr
Transfer Points: 2 Transfers

PM Emissions

Emission Factor: 0.12 lb/ton (AP-42 Table 11.24-2, 01/95)
Calculations: 0.12 lb/ton * 60,000 ton/yr * 2 Transfers * 0.0005 ton/lb = 7.2 ton/yr

PM_{10} Emissions

Emission Factor: 0.06 lb/ton (AP-42 Table 11.24-2, 01/95)
Calculations: 0.06 lb/ton * 60,000 ton/yr * 2 Transfers * 0.0005 ton/lb = 3.6 ton/yr

****** Gasoline Use Emissions

- Mobile particulate and gaseous emissions are insignificant at this facility.

****** Diesel Use Emissions

- Mobile particulate and gaseous emissions are insignificant at this facility.

** EF Matte/TBRC Slag Dryer Emissions

- Process PM_{10} emissions are not counted in the total facility PTE because emissions from these sources are routed to smelter circuit #2 baghouse and emissions have already been counted for that source.

TBRC Matte Dryer Emissions

- Process PM_{10} emissions are not counted in the total facility PTE because emissions from these sources are routed to smelter circuit #2 baghouse and emissions have already been counted for that source.

***** Refinery Main Scrubber Emissions

- No particulate in process: vapor mist emissions only.

***** Refinery Electrowin Scrubber Emissions

- No particulate in process: vapor mist emissions only.

***** Refinery Electrowin Area

- No particulate in process: vapor mist emissions only.

***** SO_2 Hygeine Fan

- No particulate in process: vapor mist emissions only. Emergency SO_2 emissions vent if levels in building increase to unsafe levels.

***** Granulator

- No particulate emissions: vapor mist emissions only.

* Revert Crushing Area Emissions

- Process PM_{10} Emissions are not counted in the total facility PTE because emissions from these sources are routed to smelter circuit #1 baghouse and emissions have already been counted for that source.

*** 30-ton Wet Concentrate Dryer Feed Hopper

Max. Material Handled: 47,450 ton/yr (Company Information)
Control Efficiency: 90% (Building Enclosure)

PM Emissions

Emission Factor: 0.01 lb/ton (AP-42 Table 11.24-2, 01/95)
Calculations: 0.01 lb/ton * 47450 ton/yr * 0.0005 ton/lb * (1-0.9) = 0.02 ton/yr

PM_{10} Emissions

Emission Factor: 0.004 lb/ton (AP-42 Table 11.24-2, 01/95)
Calculations: 0.004 lb/ton * 47450 ton/yr * 0.0005 ton/lb * (1-0.9) = 0.01 ton/yr

*** 40-ton #2 Dried Concentrates Bin Emissions

Emission Factor: 0.022 gr/dscf
Hours of Operation: 8760 hr/yr
Baghouse Airflow: 4611 dscfm (manufacturers rating)
Control Efficiency: 99% (indoor venting source with baghouse control)

PM_{10} Emissions

0.022 gr/dscf * 4611 dscfm * 60 min/hr * 8760 hr/yr * 1 lb/7000 gr * 0.0005 ton/lb * (1 - 0.99) = 0.0381 ton/yr

- Assume all PM emissions are PM_{10}

*** Dust Bin Emissions

Emission Factor: 0.022 gr/dscf
Hours of Operation: 8760 hr/yr
Baghouse Airflow: 1366 dscfm (manufacturers rating)
Control Efficiency: 99% (indoor venting source with baghouse control)

PM_{10} Emissions

0.022 gr/dscf * 1366 dscfm * 60 min/hr * 8760 hr/yr * 1 lb/7000 gr * 0.0005 ton/lb * (1 - 0.99) = 0.0113 ton/yr
Assume all PM emissions are PM_{10}

*** Secondaries/Iron Residue Bin Emissions

Max. Material Handled: 7,500 ton/yr (Company Information)
Control Efficiency: 90% (Building Enclosure)

PM Emissions

Emission Factor: 0.12 lb/ton (AP-42 Table 11.24-2, 01/95)
Calculations: 0.12 lb/ton * 7500 ton/yr * 0.0005 ton/lb * (1-0.9) = 0.05 ton/yr

PM_{10} Emissions

Emission Factor: 0.06 lb/ton (AP-42 Table 11.24-2, 01/95)
Calculations: 0.06 lb/ton * 7500 ton/yr * 0.0005 ton/lb * (1-0.9) = 0.02 ton/yr

*** TBRC Slag Bin Emissions

Max. Material Handled: 6,000 ton/yr (Company Information)
Control Efficiency: 90% (Building Enclosure)

PM Emissions

Emission Factor: 0.12 lb/ton (AP-42 Table 11.24-2, 01/95)

Calculations: 0.12 lb/ton * 6000 ton/yr * 0.0005 ton/lb * (1-0.9) = 0.04 ton/yr

PM_{10} Emissions

Emission Factor: 0.06 lb/ton (AP-42 Table 11.24-2, 01/95)
Calculations: 0.06 lb/ton * 6000 ton/yr * 0.0005 ton/lb * (1-0.9) = 0.02 ton/yr

*** EF Matte Bins (4) Emissions

Max. Material Handled: 15,000 ton/yr (Company Information)
Control Efficiency: 90% (Building Enclosure)

PM Emissions

Emission Factor: 0.12 lb/ton (AP-42 Table 11.24-2, 01/95)
Calculations: 0.12 lb/ton * 15000 ton/yr * 0.0005 ton/lb * (1-0.9) = 0.09 ton/yr

PM_{10} Emissions

Emission Factor: 0.06 lb/ton (AP-42 Table 11.24-2, 01/95)
Calculations: 0.06 lb/ton * 15000 ton/yr * 0.0005 ton/lb * (1-0.9) = 0.05 ton/yr

***** Security Area Electric Dryers Emissions

- Electric. No particulate in process: vapor mist emissions only.

Moffit NG Fired Smelter Building Heaters

Operating Parameters

Hours of Operation: 8760 hr/yr
Combustion Rate: 9.6 MMBtu/hr (Combined – 2 Heaters)
Fuel Heating Value: 0.001 MMscf/MMBtu

PM_{10} Emissions

Emission Factor:	7.6 lb/MMscf (AP-42, Table 1.4-2, 07/98)	
Calculations:	7.6 lb/MMscf * 0.001 MMscf/MMBtu * 9.6 MMBtu/hr =	0.07 lb/hr
	0.07 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	0.32 ton/yr

- Assume all PM emissions are PM_{10}

SO_X Emissions

Emission Factor:	0.60 lb/MMscf (AP-42, Table 1.4-1, 07/98)	
Calculations:	0.60 lb/MMscf * 0.001 MMscf/MMBtu * 9.6 MMBtu/hr =	0.01 lb/hr
	0.01 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	0.03 ton/yr

NO_X Emissions

Emission Factor:	100 lb/MMscf (AP-42, Table 1.4-1, 07/98)	
Calculations:	100 lb/MMscf * 0.001 MMscf/MMBtu * 9.6 MMBtu/hr =	0.96 lb/hr
	0.96 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	4.20 ton/yr

CO Emissions

Emission Factor:	84 lb/MMscf (AP-42, Table 1.4-2, 07/98)	
Calculations:	84 lb/MMscf * 0.001 MMscf/MMBtu * 9.6 MMBtu/hr =	0.81 lb/hr
	0.81 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	3.53 ton/yr

VOC Emissions

Emission Factor:	5.50 lb/MMscf (AP-42, Table 1.4-2, 07/98)	
Calculations:	5.50 lb/MMscf * 0.001 MMscf/MMBtu * 9.6 MMBtu/hr =	0.05 lb/hr
	0.05 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	0.23 ton/yr

Circular NG Refinery Building Heater

Operating Parameters

Hours of Operation:	8760 hr/yr
Combustion Rate:	1.2 MMBtu/hr (Combined – 2 Heaters)
Fuel Heating Value:	0.001 MMscf/MMBtu

PM_{10} Emissions

Emission Factor:	7.6 lb/MMscf (AP-42, Table 1.4-2, 07/98)	
Calculations:	7.6 lb/MMscf * 0.001 MMscf/MMBtu * 1.2 MMBtu/hr =	0.0.01 lb/hr
	0.01 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	0.0.04 ton/yr

- Assume all PM emissions are PM_{10}

SO_X Emissions

Emission Factor:	0.60 lb/MMscf (AP-42, Table 1.4-1, 07/98)	
Calculations:	0.60 lb/MMscf * 0.001 MMscf/MMBtu * 1.2 MMBtu/hr =	0.001 lb/hr
	0.001 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	0.003 ton/yr

NO_X Emissions

Emission Factor:	100 lb/MMscf (AP-42, Table 1.4-1, 07/98)	
Calculations:	100 lb/MMscf * 0.001 MMscf/MMBtu * 1.2 MMBtu/hr =	0.12 lb/hr
	0.12 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	0.53 ton/yr

CO Emissions

Emission Factor:	84 lb/MMscf (AP-42, Table 1.4-2, 07/98)	
Calculations:	84 lb/MMscf * 0.001 MMscf/MMBtu * 1.2 MMBtu/hr =	0.10 lb/hr
	0.10 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	0.44 ton/yr

VOC Emissions

Emission Factor:	5.50 lb/MMscf (AP-42, Table 1.4-2, 07/98)	
Calculations:	5.50 lb/MMscf * 0.001 MMscf/MMBtu * 1.2 MMBtu/hr =	0.01 lb/hr
	0.01 lb/hr * 8760 hr/yr * 0.0005 ton/lb =	0.03 ton/yr

*** Secondary Preparation Building Baghouse Emissions

Emission Factor:	0.022 gr/dscf (40 CFR 60, Subpart LL)
Hours of Operation:	8760 hrs/yr
Baghouse Flowrate Capacity:	18,043 dscfm (manufacturer's information)
Control Efficiency:	90% (Building Enclosure)

PM Emissions

- Assume all PM emissions are PM_{10}

PM_{10} Emissions

0.022 gr/dscf * 18043 dscfm * 60 min/hr * 8760 hr/yr * 1 lb/7000 gr * 0.0005 ton/lb * (1-0.9) = 1.49 ton/yr

****** Refinery Laboratory Scrubbers (2)

- No particulate in process: acid gas emissions only.

IV. Existing Air Quality

Stillwater's facility is located in Stillwater County, Montana. Stillwater County is currently classified as attainment for all National Ambient Air Quality Standards (NAAQS). The current permit action does not result in an increase in any potential emissions; therefore, the current permit action will not affect the existing air quality of the area.

V. BACT Determination

A BACT determination is required for each new or altered source. Stillwater shall install on the new or altered sources the maximum air pollution control capability, which is technically practicable and economically feasible, except that BACT shall be utilized.

BACT is defined as an emission limitation, based on the maximum degree of reduction for each pollutant subject to regulation that would be emitted from a new or modified source for which the Department, on a case-by-case basis, taking into account energy, environmental, and economic impacts, and other costs, determines is achievable for the new or modified unit through application of control(s). Under various circumstances, the Department may prescribe a design, equipment, work practice, operational standard, or a combination thereof, in lieu of an emission limit, to require the application of BACT.

Under the current permit action, Stillwater is proposing a relaxation of currently permitted BACT requirements for fabric filter baghouse control on the Lime Flux Bin(s), the EF Matte Bin (High-Grade Revert Bin), the TBRC Slag Bin (Low-Grade Revert Bin), and the Secondaries/Iron Residue Bin (Iron Residues/Secondaries Bin). The previous BACT determination for these sources, based primarily on Stillwater's proposed BACT emission controls and Department concurrence (see permit application for Permit #2635-06), required that Stillwater incorporate fabric filter baghouse control to capture particulate emissions from these operations.

The previous sources currently do not incorporate the required BACT controls, rather, these units are contained within the smelter building with no additional control incorporated. Current Department guidance allows for a 90% PM/PM_{10} control factor for sources venting to or contained within a building enclosure. The following BACT determination analyzes various PM/PM_{10} control strategies used for the previously listed and/or similar process operations.

PM/PM_{10} BACT Analysis

Due to the nature of the previously listed process operations at the Stillwater facility, fugitive PM and PM_{10} emissions result from normal operations. The concentration of PM and PM_{10} emissions can be reduced by using various control technologies including electrostatic precipitators (ESPs), wet scrubbers, and/or fabric filters (baghouses). In addition, the following BACT analysis discusses no add-on control for sources contained within a building enclosure as BACT for these sources.

1. ESPs

An ESP is a particle control device that uses electric forces to remove particles from a contaminated air stream and onto collector plates. The particles are given an electric charge

by forcing them through a corona that surrounds a highly charged electrode, frequently a wire. The electrical field then forces the charged particles to the opposite charged electrode, usually a plate. Solid particles are removed from the collecting plate by a shaking process known as "rapping".

ESPs are employed when collection efficiencies of greater than 90% are required. ESPs are often used downstream of mechanical collector pre-cleaners that remove the larger size particulate matter. Collection efficiencies of 90 to 99% for PM/PM_{10} have been observed for ESPs.

Because the sources in question are contained within the smelter building and, in accordance with current Department guidance, inherently have an associated 90% PM/PM_{10} control factor, potential emissions from these sources are minor (see Section III, Emission Inventory, Permit Analysis for this permit). Therefore, the addition of ESP control to these sources would be cost prohibitive. The Department determined that addition of ESP control does not constitute BACT in this case.

2. Wet Scrubbers

Wet scrubbers typically use water to impact, intercept, or diffuse particle-laden air. With impaction, particle matter is accelerated and impacted onto a surface area or into a liquid droplet through devices such as venturis and/or spray chambers. When using interception, particles flow nearly parallel to the water droplets, allowing the water to intercept the particles. This strategy works most effectively for sub-micron particles. Spray augmented scrubbers and high-energy venturis employ this mechanism. Diffusion is used for particles of 0.5 micron (μm) or smaller and in situations where there is a large temperature difference between the contaminated air stream and the scrubbing media. The particles migrate through the spray along lines of irregular gas density and turbulence, contacting droplets of approximately equal energy.

Six particle scrubber designs are used in control application such as that proposed: spray, wet dynamic, cyclonic spray, impactor, venturi, and augmented. In all of these scrubbing technologies, impaction is the mechanism for collecting particles larger than 3 μm. Since smaller sized particles respond to non-inertial forces, a high density of small droplets is needed to effectively trap these particles. This is accomplished at the price of high energy consumption due to hydraulic and velocity pressure losses.

The most widely used wet scrubbers are venturi scrubbers. With gas-side pressure drops exceeding 15 inches of water, particulate collection efficiencies of 85% or greater have been reported.

Because the sources in question are contained within the smelter building and, in accordance with current Department guidance, inherently have an associated 90% PM/PM_{10} control factor associated with indoor operations, potential emissions from these sources are minor (see Section III, Emission Inventory, Permit Analysis for this permit). Therefore, the addition of wet scrubber control to these sources would be cost prohibitive. The Department determined that addition of wet scrubber control does not constitute BACT in this case.

3. Baghouses

Baghouses consist of one or more isolated compartments containing rows of fabric filter bags or tubes. Gas flows pass through the fabric where the particle is retained on the upstream face of the bags, while the cleaned gas stream is vented to the atmosphere or on to another control device. Baghouses are effective for the control of particles from sub-micron to several hundred microns at gas temperatures up to about 500ºF.

Fabric filters can be characterized by the types of cleaning devices (shaker, reverse-air, and pulse-jet), direction of gas flow, location of the system fan, and the gas-flow quantity. Typically the type of cleaning method distinguishes the fabric filter.

Advantages to baghouses are the high collection efficiencies (in excess of 99%) and the collection of a wide range of particle sizes. The disadvantages in clued the narrow temperature window of up to approximately 500 to 550ºF (for typical installations), high pressure drops, and problems with gas streams that are corrosive or sticky.

As previously stated, the BACT analysis conducted for Permit #2635-06 required that Stillwater install and operate fabric filter baghouse control for the sources in question. Primarily, this determination was made based on the fact that Stillwater proposed the installation and operation of baghouse control through the permit application process and the Department concurred that baghouse control would constitute BACT for sources of this type. However, because the sources in question are contained within the smelter building and, in accordance with current Department guidance, inherently have an associated 90% PM/PM_{10} control factor associated with indoor operations, potential emissions from these sources are minor (see Section III, Emission Inventory, Permit Analysis for this permit). Therefore, the addition of baghouse control to these sources would be cost prohibitive. The Department determined that the proposed relaxation of the required baghouse control BACT determination, made under Permit #2635-06, is appropriate; therefore, the use of fabric filter baghouse control will not constitute BACT in this case.

4. No Additional Control/Building Enclosure

As previously stated, Stillwater currently houses the equipment/operations in question within the smelter building. Further, current Department guidance indicates that sources of this type locating/operating within a complete building enclosure have an inherent 90% PM/PM_{10} control factor associated with operating within the enclosure. Therefore, emissions associated with the indoor operations are minor (see Section III, Emission Inventory, Permit Analysis for this permit) and, after further review, the Department determined that the installation and operation of any add-on control would be cost prohibitive. The Department determined that building enclosure with no additional control will constitute BACT in this case.

PM/PM_{10} BACT Analysis Summary and Determination

In summary, the Department analyzed the use of ESPs, wet scrubbers, fabric filter baghouses, and building enclosure with no add-on control, as possible PM/PM_{10} control strategies for the previously cited emission sources. All of the previously mentioned control strategies are capable of significant PM/PM_{10} emission reductions; however, because building enclosures alone, are capable of achieving significant reduction of PM/PM_{10} emissions without add-on controls, the Department considers the use of building enclosures with no additional control to be BACT in this case.

The control options selected have controls and control costs comparable to other recently permitted similar sources and are capable of achieving the appropriate emission standards.

VI. Ambient Air Impact Analysis

The Department determined that the current permit action will not result in an exceedance of the Montana or National Ambient Air Quality Standards.

VII. Taking or Damaging Implication Analysis

As required by 2-10-101 through 105, MCA, the Department conducted a private property taking and damaging assessment and determined there are no taking or damaging implications.

VIII. Environmental Assessment

An environmental assessment, required by the Montana Environmental Policy Act, was completed for this project. A copy is attached.

DEPARTMENT OF ENVIRONMENTAL QUALITY
Permitting and Compliance Division
Air and Waste management Bureau
P.O. Box 200901, Helena, Montana 59620
(406) 444-3490

FINAL ENVIRONMENTAL ASSESSMENT (EA)

Issued To: Stillwater Mining Company
Columbus Metallurgical Complex

Air Quality Permit number: 2635-10

Preliminary Determination Issued: May 12, 2003
Department Decision Issued: June 5, 2003
Permit Final: June 21, 2003

1. *Legal Description of Site*: The legal description of the site is Section 27, Township 2 South, Range 20 East, Stillwater County, Montana.

2. *Description of Project*: the current permit action provides for an increase in the previously proposed and permitted (Permit #2635-09) operational limits on the production of gypsum, production of slag, and the use of crushed rock to line the slag-pit; A review and relaxation of previous BACT determinations requiring fabric filter baghouse control for various bins and silos contained in the smelter building (Permit #2635-06); permit clarification of required control technology for the concentrate dryer operations at the facility; the addition of 2 natural gas-fired dryers to the Laboratory Sample Prep Area under ARM 17.8.744(1)(c); the replacement of the existing and permitted revert cone crusher with a like-kind revert cone crusher; and the incorporation of permit language to potentially allow for future off-permit "like-kind" replacement of various equipment to the permitted facility.

3. *Objectives of Project*: Under the current permit action, Stillwater is proposing a relaxation of currently permitted BACT requirements for fabric filter baghouse control on the Lime Flux Bin, the EF Matte Bin (High-Grade Revert Bin), the TBRC Slag Bin (Low-Grade Revert Bin), and the Secondaries/Iron Residue Bin (Iron Residues/Secondaries Bin). The previous BACT determination, based primarily on Stillwater's proposed BACT emission controls and Department concurrence (see permit application for Permit #2635-06), required that Stillwater incorporate fabric filter baghouse control to capture particulate emissions from these operations. After further review the Department determined that the relaxation of baghouse control for these units is appropriate.

   Also, the current permit action allows for the installation and operation of a replacement revert crusher for an existing like-kind revert crusher, under ARM 17.8.745(1). Further, in an effort to simplify future facility operations/permit considerations, Stillwater proposed permit language, for various existing emitting units (including the proposed revert crusher), that would allow for off-permit, like-kind, replacement of this equipment under ARM 17.8.745(1).

   Finally, the current permit action clarifies existing permitted control requirements for the concentrate dryer to ensure maintenance of compliance regarding this unit.

4. *Alternatives Considered*: In addition to the proposed action, the Department also considered the "no-action" alternative. The "no-action" alternative would deny issuance of the Montana Air Quality Permit to the proposed facility. However, the Department does not consider the "no-action"

alternative to be appropriate because Stillwater demonstrated compliance with all applicable rules and regulations as required for permit issuance. Therefore, the "no-action" alternative was eliminated from further consideration.

5. *A Listing of Mitigation, Stipulations, and Other Controls*: A list of enforceable conditions, including a BACT analysis, would be included in Permit #2635-10.

6. *Regulatory Effects on Private Property*: The Department considered alternatives to the conditions imposed in this permit as part of the permit development. The Department determined that the permit conditions are reasonably necessary to ensure compliance with applicable requirements and demonstrate compliance with those requirements and do not unduly restrict private property rights.

7. The following table summarizes the potential physical and biological effects of the proposed project on the human environment. The "no-action" alternative was discussed previously.

		Major	Moderate	Minor	None	Unknown	Comment Included
A	Terrestrial and Aquatic Life and Habitats			X			Yes
B	Water Quality, Quantity, and Distribution			X			Yes
C	Geology and Soil Quality, Stability and Moisture			X			Yes
D	Vegetation Cover, Quantity, and Quality			X			Yes
E	Aesthetics			X			Yes
F	Air Quality			X			Yes
G	Unique Endangered, Fragile, or Limited Environmental Resources			X			Yes
H	Demands on Environmental Resource of Water, Air and Energy			X			Yes
I	Historical and Archaeological Sites				X		Yes
J	Cumulative and Secondary Impacts			X			Yes

SUMMARY OF COMMENTS ON POTENTIAL PHYSICAL AND BIOLOGICAL EFFECTS: The following comments have been prepared by the Department.

A. Terrestrial and Aquatic life and Habitats
B. Water Quality, Quantity and Distribution
C. Geology and Soil Quality, Stability and Moisture
D. Vegetation Cover, Quantity, and Quality
E. Aesthetics
F. Air Quality
G. Unique Endangered, Fragile, or Limited Environmental Resources

The proposed permit action would result in minor impacts to the above-cited physical and biological resources of the human environment of the area because the installation and operation of the 2 proposed natural gas fired dryers in the Laboratory Sample Prep Area would result in a minor increase in actual facility emissions (an emission inventory would be contained in Section III of the permit analysis). Further, the installation and operation of the proposed dryers is specifically exempt from permitting requirements under ARM 17.8.744(1)(c). The Department determined that any potential impacts would be minor due to the relatively low emissions increase associated with the proposed dryers and because the increased emissions would disperse to the surrounding environment.

All other proposed changes would not impact the above-cited physical and biological resources because existing facility operations would not change as a result of the proposed permit action. Stillwater does not currently, and has not in the past, operated the various indoor bins and silos in accordance with permitted BACT requirements and the current permit action would change these requirements to require current emission control practices at the facility, thus, no increase in actual emissions would result. In addition, the proposed revert crusher replacement would be a like-kind replacement incorporating identical emission control with no increase in actual or potential emissions. Further, the proposed language, allowing for future like-kind replacement of various existing equipment, would not impact future facility emissions because the facility would not be allowed to increase potential emissions without first obtaining a permit, rather, the proposed language would only allow for the like-kind replacement of certain equipment under ARM 17.8.745(1). Finally, the increased gypsum and smelter slag production and waste ore handling limits would be permitted under the provisions of ARM 17.8.745(1) and again would not result in an actual increase in facility emissions, as the previous limits were permitted based on actual production numbers. The increased allowable production would be permitted to allow for operational flexibility.

Overall, the proposed permit action would result in only a minor potential impact to the above-cited physical and biological resources of the human environment of the area.

H. Demands on Environmental Resource of Water, Air, and Energy

The proposed permit action would result in only a minor demand for resources of water, air, and energy because overall facility operations would not appreciably change as a result of the proposed permit action. The installation and operation of the proposed natural gas fired dryers would result in minor impacts to air and energy resources because operation of the new units would require a small amount of additional energy and, as described in Section 7.F above, emissions to the atmosphere would increase as a result of the project. The proposed dryers would not impact water resources as no additional water would be required for normal operations and the relatively low emission increases associated with the proposed dryers would disperse to the surrounding environment resulting in no additional impact to surrounding water resources.

All other proposed changes would not impact the above-cited physical and biological resources because existing facility operations would not change as a result of the proposed permit action. Overall, any impact to the environmental resources of water, air, and energy would be minor.

I. Historical and Archaeological Sites

The proposed project would not result in any impact to any existing historical and archaeological sites in the proposed project area because the proposed natural gas fired dryers would operate within an existing building located within the existing Stillwater industrial site and would not require any additional construction or ground disturbance. Further, all other proposed changes would not impact any historical or archaeological site because affected equipment operations would not change as a result of the current permit action. Also, according to previous correspondence from the Montana State Historic Preservation Office, there is low likelihood of any disturbance to any known archaeological or historic site, given previous industrial disturbance within a given area. Therefore, the proposed project would have no impact on any historic or archaeological site that may be located in or near the proposed operating site.

J. Cumulative and Secondary Impacts

The proposed permit action would result in only minor cumulative or secondary impacts to the physical or biological resources of the human environment because the proposed changes would not

change existing facility operations and would result in only a minor increase in facility wide emissions resulting from the installation and operation of the 2 proposed natural gas fired dryers under ARM 17.8.744(1)(c). Further, the Department determined that any impacts would be minor because the proposed equipment would locate within an existing industrial site and would result in only minor potential emissions. All other proposed changes would not impact the above-cited physical and biological resources because existing facility operations would not change as a result of the proposed permit action. The Department believes that this facility could be expected to operate in compliance with all applicable rules and regulations as outlined in Permit #2635-10.

8. The following table summarizes the potential economic and social effects of the proposed project on the human environment. The "no-action" alternative was discussed previously.

		Major	Moderate	Minor	None	Unknown	Comment Included
A	Social Structures and Mores				X		Yes
B	Cultural Uniqueness and Diversity				X		Yes
C	Local and State Tax Base and Tax Revenue				X		Yes
D	Agricultural or Industrial Production				X		Yes
E	Human Health			X			Yes
F	Access to and Quality of Recreational and Wilderness Activities				X		Yes
G	Quantity and Distribution of Employment				X		Yes
H	Distribution of Population				X		Yes
I	Demands for Government Services			X			Yes
J	Industrial and Commercial Activity				X		Yes
K	Locally Adopted Environmental Plans and Goals				X		Yes
L	Cumulative and Secondary Impacts			X			Yes

SUMMARY OF COMMENTS ON POTENTIAL ECONOMIC AND SOCIAL EFFECTS: The following comments have been prepared by the Department.

A. Social Structures and Mores
B. Cultural Uniqueness and Diversity

The proposed project would not impact the above-cited economic and social resources of the human environment of the proposed area of operation because the predominant use of the surrounding area would not change as a result of the proposed project.

C. Local and State Tax Base and Tax Revenue

The proposed facility/permit changes would not impact local and state tax base and tax revenue because facility operations would not change as a result of the proposed changes. Further, the project would not require any new construction and only a limited number of existing employees/operators would be required for normal operations.

D. Agricultural or Industrial Production

The proposed facility/permit changes would not impact any agricultural or industrial production because facility operations would not change as a result of the proposed changes. Also, because all proposed changes would operate in an existing building within an existing industrial area, the project would not impact or displace any land used for agricultural production and would not require any additional construction. Further, no impact to industrial production would be realized as a result of

the project because facility productivity and operation would not be affected by the current permit action.

E. Human Health

The proposed facility equipment changes/additions would result in only a minor increase in actual emissions from the facility, as described in Section 7.F of this EA. Further, as described in Section IV of the permit analysis, Stillwater would be required to apply BACT under the current permit action. In addition, the new dryers would result in only a minor increase in emissions from the Stillwater facility. Stillwater would be required to maintain compliance with all applicable National and Montana Ambient Air Quality Standards (NAAQS/MAAQS), these standards are designed to be protective of human health. Any health impacts resulting from the proposed project would be minor.

F. Access to and Quality of Recreational and Wilderness Activities

The proposed project, as a whole, would not result in any impact to access and quality of any recreational and wilderness activities in the area of operations because the proposed changes would not change overall facility operations and the proposed dryers would be located within an existing building at the Stillwater facility.

G. Quantity and Distribution of Employment

H. Distribution of Population

The proposed project would not require any new employment at the facility. Facility-wide operations would not change as a result of the current permit action and operation of the 2 proposed natural gas fired dryers would be accomplished by existing personnel. Overall, the current permit action would not result in any impact to the above-cited economic and social resources of the human environment.

I. Demands for Government Services

Government services would be required for acquiring the appropriate permits from government agencies. In addition, the permitted source of emissions would be subject to periodic inspections by government personnel. Demands for government services would be minor.

J. Industrial and Commercial Activity

The proposed project would not change facility-wide operations; therefore, no impact to industrial or commercial activity would be realized as a result of the proposed permit/facility equipment changes. Further, the proposed project is small by industrial standards and no increase in actual production from the facility would occur as a result of the current permit action. The proposed project, as a whole, would not result in any impact to commercial activity in the area of operations.

K. Locally Adopted Environmental Plans and Goals

The Department is not aware of any locally adopted environmental plans or goals in the immediate area affected by the proposed project. The state standards would be protective of the proposed project area.

L. Cumulative and Secondary Impacts

Overall, cumulative and secondary impacts from the proposed project would result in only minor impacts to the economic and social resources of the human environment in the immediate area because the facility operations would not change as a result of the current permit action. Further, the proposed project is small by industrial standards and would not require any additional employment

for normal operations. The Department believes that this facility could be expected to operate in compliance with all applicable rules and regulations as would be outlined in Permit #2635-10.

Recommendation: No EIS is required.

If an EIS is not required, explain why the EA is an appropriate level of analysis: The current permitting action is for the relaxation of previously permitted BACT requirements; modification of various permit language for future permit considerations and operational flexibility; the like-kind replacement of an existing crusher; an increase in allowable gypsum and smelter slag production and increased waste ore utilization, and the off-permit construction and operation of 2 new natural gas fired dryers in accordance with ARM 17.8.744(1)(c). Permit #2635-10 includes conditions and limitations to ensure the facility would operate in compliance with all applicable rules and regulations. In addition, there would be no significant impacts associated with this proposal.

Other groups or agencies contacted or which may have overlapping jurisdiction: Montana Historical Society – State Historic Preservation Office.

Individuals or groups contributing to this EA: Department of Environmental Quality – Air and Waste management Bureau, Montana Historical Society – State Historic Preservation Office.

EA prepared by: M. Eric Merchant, MPH
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